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AMERICAN BEE JOURNAL

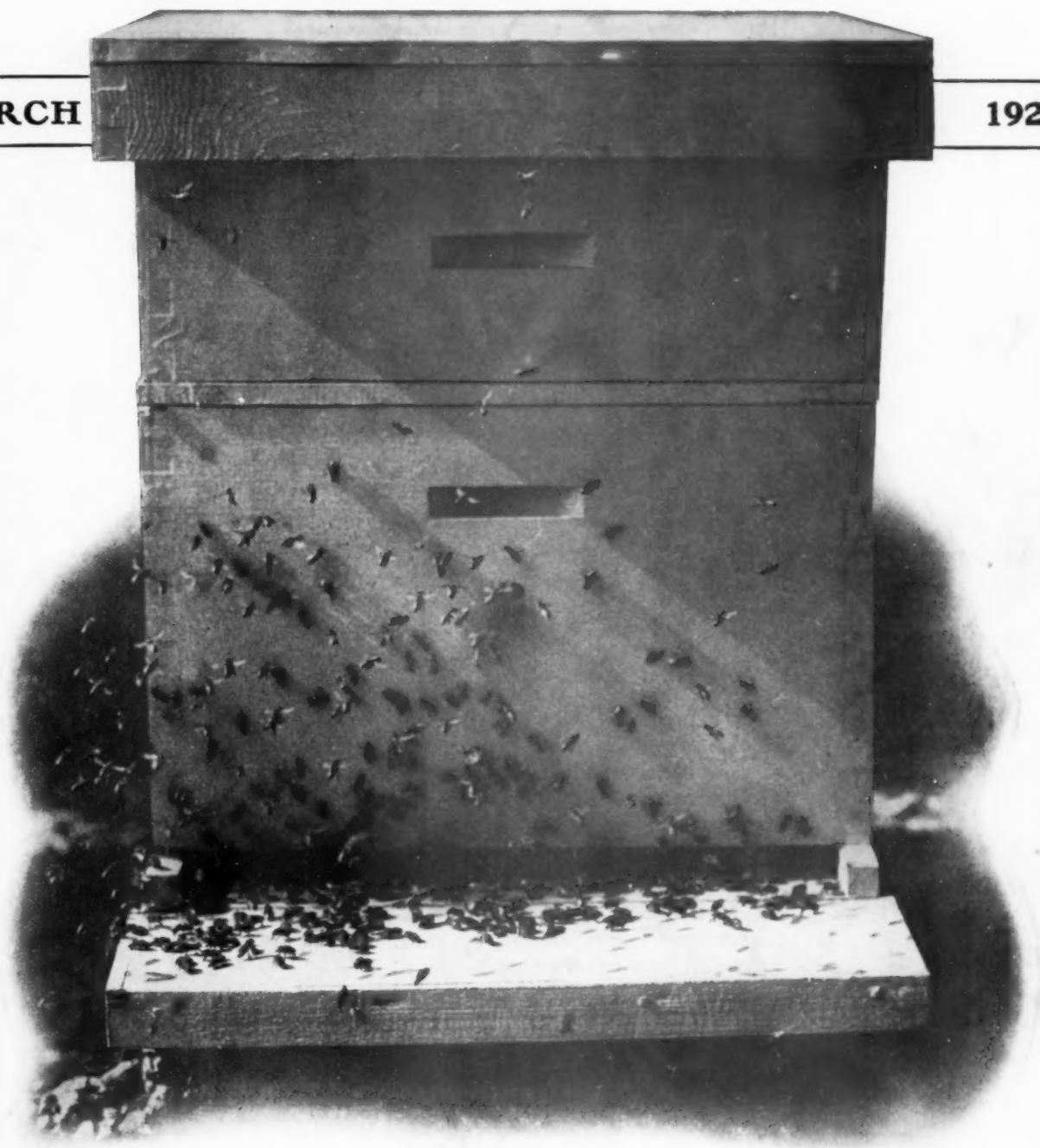
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DETROIT

MARCH

1928



INFLUENCE OF DEVELOPMENT ON
WORKER AND QUEEN — W. W. ALPATOV
PACKAGES VS. OVERWINTERED BEES
FOR ORCHARDS — RAY HUTSON

ORIGIN AND USE OF EXTRAFLORAL
NECTARIES — JOHN H. LOVELL
THIS BUSINESS OF PRODUCING HONEY —
G. H. CALE

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WHEELING'S 60# 5-gallon Square Can is a top-notch honey container! Top and bottom are *double seamed and soldered*, making a leak-proof container of exceptional strength. Furnished with 1 $\frac{3}{4}$ ", 2" and 2 $\frac{3}{4}$ " screw cap with cork or paraffined pulp-board liners in either 107# or 135# tinplate.

We are also in position to furnish all sizes of friction top honey and syrup cans. Let us quote prices on your requirements.

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"Since 1901"

Superior Italian Bees and Queens

Whatever your requirements are in Bees, we can supply you.

We are here to serve you.

Over 3,000 colonies producing Baby Bees.

Six thousand queen mating nuclei to supply fresh young queens to put in packages.

Orders booked without deposit.

Overweight packages of Baby Bees.

Shipments made on dates requested.

Should there be loss, replacements will be sent by prepaid express.

All young queens.

Satisfaction in every respect guaranteed.

Package Bees **Italian Queens**
Full Colonies **Cypress Bee Hives**

Send for large catalog

We are equipped to supply your every need in Bees, Queens, and Bee Supplies. We can furnish you anything from a queen to a carload of colonies. Write us and see if we can't sell you your outfit for less.

REDUCED PRICES

	1	5	10	25	50
Two-pound Packages with Queens:	\$4.00	\$3.75	\$3.60	\$3.50	\$3.25
	1	5	10	25	50
Three-pound Package with Queens:	\$5.00	\$4.75	\$4.60	\$4.50	\$4.25
Superior Italian Queens to June 15:	Untested		1	10	100
	Tested		\$1.00	\$.85	\$.75
			.50	more per queen	

THE STOVER APIARIES, Tibbee Station, Miss.

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Quality

Muth's Supplies

Low Prices

The saving in your purchase of Bee Supplies from us often pays the transportation from Cincinnati to your station. Note the attractive prices.

Hercules Med. Brood.....\$4.00 for 5 lbs., \$18.75 for 25 lbs.
Thin Surplus 4.25 for 5 lbs., 20.00 for 25 lbs.

Quantity	Description	8-fr.	10-fr.
5	One-story Metal Cover Hives Comp.	\$11.90	\$13.60
5	One-story Wood Cover Hives Comp	9.95	10.95
5	No. 1 Comb Honey Supers (4 1/4 x 1 7/8)	3.55	3.85
5	No. 2 Comb Honey Supers (4 1/4 x 1 1/2)	4.95	5.30
5	No. 4 Comb Honey Supers (4x5)	5.80	6.45
5	Shallow Ext. Supers (5 3/4 Frs.)	3.75	4.45
5	Bodies with Hoffman Frames	5.65	6.20

(All the above are complete, but without sections or foundation)

Send for our free 1928 Bee Supply catalog. The five lucky names for this month are:

Mrs. Mattie Pully, North Carolina
Orlando Kizer, Indiana
Elias Shelton, Alabama
Theo. E. Hamilton, Illinois
Charles Geest, Iowa

THE FRED W. MUTH CO. CINCINNATI, OHIO

What About Queens and Bees?

This question confronts aggressive beekeepers at the approach of spring. It is poor economy to tolerate failing queens, or carry empty hives.

ROOT QUALITY QUEENS will help to increase your honey crop. Write for our free booklet, "Combless Package Bees."

PRICES FOR U. S. A. AND CANADA ONLY April 15 to June 15

Untested	1	\$1.50 each	10	\$1.25 each
Tested		2.50 each		2.25 each
Select Tested		5.00 each		

Fifty or over, write for prices

Customers outside U. S. A. and Canada must add 25 cents per queen to above prices to cover extra postage and cost of larger cages. Queens shipped at customer's risk.

Note: Our UNTESTED QUEENS are young, fertile queens reared this season that prove to be approximately 99 per cent purely mated.

Our TESTED QUEENS are older queens guaranteed purely mated.

Our SELECT TESTED QUEENS are choice tested queens that might be used as breeding queens, although they are not tested for breeding purposes.

PRICES OF BEES IN TWO-POUND COMBLESS PACKAGES BY EXPRESS April 15 to August 15

1 to 9 Two-pound package of bees	\$4.50 each
10 to 24 Two-pound packages	4.00 each

Twenty-five or more two-pound packages, write for prices

THE A. I. ROOT CO.

West Side Station

Medina, Ohio

Wherever Forehand's Bees and Queens Go

wherever they travel—north, south, east or west—they are commended

"They sure are hustlers."

"As pretty as I ever hope to see in color and size."

"Large, uniform, industrious, and for gentleness unsurpassed."

"I have never received a bad queen from you."

"I wish to thank you for prompt and satisfactory service."

All of these words come from men who have used them—sincere, unsolicited reports.

	1-12	12-25	25-99
Untested	\$1.00	\$.85	\$.80
Select untested	1.25	1.00	.90
Tested	2.00	1.75	

Combless packages and nuclei f. o. b. my station:

One pound bees and queen, \$2.75; ten or more, \$2.50. Two pounds bees and queen, \$3.75; ten or more, \$3.50. Three pounds bees and queen, \$4.75; ten or more, \$4.50.

Two frames nuclei and queen, \$4.00; ten or more \$3.75. Three frames nuclei and queen, \$5.00; ten or more, \$4.75.

If extra bees are wanted with nuclei, add \$1.00 per pound. Write for circular and prices on larger lots.

N. FOREHAND,
Gonzalez, Fla.

Send Us Your Inquiries

When You are in the Market for

**Sections, Hives, Supers,
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We are prepared to give
you fair treatment and
prompt service at all times

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It's Free

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Pacific Citrus Honey Company

General Office 564 Market Street

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Will again offer

Queens and Package Bees

For shipment during SEASON 1928, from 2,000 colonies of the finest Italian three-banded bees and proven light breeders.

Queens, \$1.00; over ten, 85c

Packages, \$2.00; with queens, \$3.00

Packages, over ten, \$1.80; with queens, \$2.65

F. O. B. Woodlake, California

10% with order

Delivery Begins March 10, 1928

Books Open for Orders Now

*The Most Rapidly Growing Package and Queen
Shippers in the West.*

WHY?

BECAUSE our bees and queens cannot be beat, their quality always brings repeat orders.

BECAUSE our bees and queens always reach their destination on time—a most vital point to the buyers of bees—our service cannot be beat.

BECAUSE our shipping point, Redding, California, makes us the most northern shippers in California, making a saving in express rates to our customers. We are on the main line going all ways.

BECAUSE we are financially responsible to handle any size order.

Our Prices On Queens

Untested laying queens	\$1.00
Lots of 100—each90

Package Bees

1- 9 Three-pound packages ..	\$4.15 each with queen
10-24 Three-pound packages ..	3.80 each with queen
25 or more 3-lb. packages ..	3.70 each with queen
1- 9 Two-pound packages ..	3.15 each with queen
10-24 Two-pound packages ..	2.80 each with queen
25 or more 2-lb. packages ..	2.70 each with queen

We will also be glad to quote you delivered to your station. Shipments start about April 1. No nuclei, virgins or one-pound packages.
Special prices on large lots

Reference: Bank of Corning, Corning, California

All package bees are sent by express. If no agent at your station, give nearest express station. Circulars furnished on request. Queens always shipped inside package bee cages.

10% Books Your Order. Balance Before Delivery

BANTA & WIRE Redding, Calif., or
Los Molinos, Calif.

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Where You Can Buy Lewis Beeware and Dadant's Foundation.
Dealers in Heavy Type Carry Large Stocks.

DEALERS & BEEKEEPERS

Beekeepers save thousands of dollars in freight each year by purchasing Lewis Beeware and Dadant's Foundation near at hand, also getting quicker service and fewer shipping losses.

Here is a group of dealers with whom we are proud to be associated, and we give them and their customers what no other manufacturers can duplicate.

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Pure, Young, Beautiful Italian
QUEENS

2-lb. package \$3.50

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PETTIT'S PACKAGE BEES SATISFY

We start shipping April 15. Order now to
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Prices with Best Young Italian Queens

Two-pound packages—5, \$4.00 each; 10, \$3.75 each; 25, \$3.65 each; 50, \$3.50 each; 100, \$3.35 each.

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For package bees without queens, deduct
80 cents from each of above prices.

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HAMILTON, ILL.

KNIGHT'S Package Bees and Queens

Three-banded leather colored Italians, the best honey gatherers, gentle and prolific. Young bees and full weight, shipped on sugar syrup, and on the day you name.

DELIVERED PRICES. PARCEL POST OR PREPAID EXPRESS.

(Write for prepaid prices to Canada)

1-lb. package, including young laying queen	\$ 3.25
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Write for prices on large lots of either packages or queens.

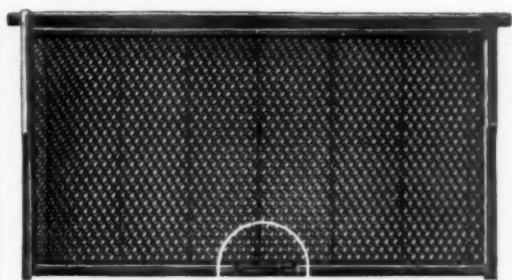
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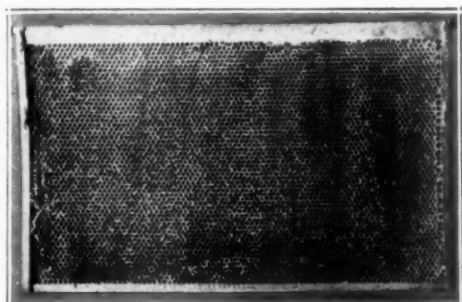
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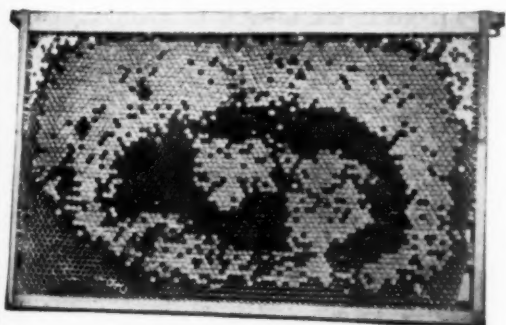
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The frames are filled with comb to the very corners and fit for worker brood from top to bottom



A whole colony of bees seems to come from every brood comb, since the queen has entire laying freedom

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An extra number of sheets can be given by making the foundation undersized. Such foundation does not fill the frames. It usually means open spaces where there is no comb at all. Over a period of years it is actually a loss instead of a saving.

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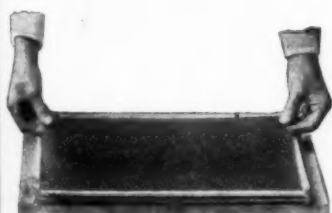
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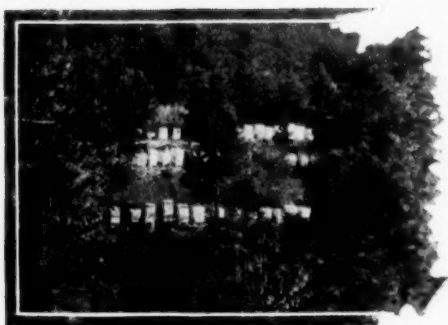
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Vol. LXVIII—No. 3

Hamilton, Illinois, March, 1928

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The Influence of the Conditions of Development on the Organism of the Worker Bee and the Queen

By W. W. Alpatov, University of Moscow*

THE queen-rearing which plays such an important part in the system of beekeeping, especially in the United States, is perfectly worked out from the practical point of view. But many of the theoretical phases of this operation are at the present moment not cleared up. Therefore it seems to me that a short discussion would be of interest for the readers of this magazine.

Prof. G. A. Koshevnikov (Moscow) is the discoverer of the most important data which explains the development of the queen and the worker bee. These data are chiefly described in his work, "Materials to the Natural History of the Honeybee," 1900-1905. This work being written in Russian is so far little known in Europe and America, and the purpose of the present article is to connect the previous discoveries of Professor Koshevnikov with modern data of German scientists who worked on the same problems.

The most important differences between the queen and the worker bee are in the structure of the sexual organs. Fig. 1 shows the genital system of a queen. (All the illustrations in this article are from the work of Professor Koshevnikov.) Each ovary consists of many egg tubes, which lead into funnel-like oviducts. In the place of meeting of the left and the right oviduct can be observed the duct of the spermathecal vesicle, in which is kept the seminal fluid of the drone, which reaches this vesicle after the nuptial flight. The number of egg tubes is very large (about 150 tubes in each ovary). The internal genital system of the worker bee looks quite dif-

ferent (see Fig. 2). The number of tubes is small, varying from one to twelve in each ovary. The spermathecal vesicle is also small and nearly always lacks a cavity.

The development of the bee can be divided into periods: the development in the egg (embryonal) and the development after hatching

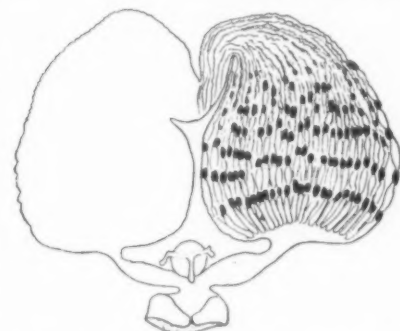


Fig. 1. Reproductive system of a queen. In the left ovary the egg tubules are not drawn. Each tubule consists of egg rudiments which alternate with nutritive chambers. (Black on the figure.) After G. A. Koshevnikov.

(postembryonal). The second period consists of three sub-periods: (1) the larval period, (2) mobile and immobile, and (3) the stage of the nymph.

The investigations of Professor Koshevnikov show that the larva newly hatched from the egg has upon the alimentary tract on the left and right sides of the body the rudiments of the future ovaries. Each larval ovary represents an oblong body; across its long axis are situated the rudiments of the future egg tubes. The newly hatched larva possesses only a restricted number of the rudiments of the egg tubes. During larval life this number increases and at the moment of the transformation of a larva into pupa, a little after sealing, the larval ovary looks like Fig. 3.

The larval egg tubes are lying in rows (the figure shows only the upper one); there are six rows, and there are about two hundred embryonal egg tubes at the moment of the beginning of transformation into immobile larva. The process described below goes on quite in the same manner in larvæ reared in worker-cells as in those which are reared in queen-cells until the beginning of the immobile stage. At the moment when the larva stops being fed and after spinning a cocoon becomes immobile, its body undergoes important modification. During this period nearly all organs and tissues of the larval body undergo a peculiar process of disintegration (histolysis) and the products of this process give origin to the organs of the pupa and hence to those of the mature bee.

The data obtained by Professor Koshevnikov show clearly that at the beginning of histolysis the ovary of the worker larva ceases to increase in size, unlike the ovary of the queen larva, which grows more and more. In the ovary of the worker larva only one to twelve tubes develop comparatively well, the others become obliterated and disappear. In the ovary of the queen larva, all the egg tubes develop perfectly well and give rise to the enormous ovary of the mature queen. All these differences in the development of the worker bee and the queen can be explained by different nourishment of the larvæ, which develop into one or another type of female members of the bee colony. It is well known throughout the investigations of previous years that only till the fourth day of the larval life the food of all the larvæ is quite the same. On the second day after hatching from the egg the larvæ which are reared as worker larvæ begin to be fed not

*The author is glad to express to Prof. E. F. Phillips his best thanks for the hospitality which he found during the summer months of the year 1927 in his laboratory (Cornell University) and where the present article was written.

with pure jelly but mixed with pollen; the queen larvæ on the contrary receive pure jelly until the moment of sealing. It was previously thought that the worker larvæ are no longer fed with royal jelly after the third day of the larval life, but the recent investigations of Lineburg (1924) have shown that the change of the food takes place earlier than the second day of the larval life. This chief conclusion which was drawn by G. A. Koshevnikov was exactly pointed out in the work of Loschel and Mayer (1913), who worked in the laboratory of Professor Zander (Germany). All these investigations explain scientifically the process of queen-rearing from eggs laid in worker cells and the procedure of artificial queen-rearing.

If different types of nourishment are able to determine two ways of development of larvæ, an intermediate nourishment must produce creatures of intermediate type between the queen and worker bee. This idea was proved by Professor Koshevnikov, who received in the post-war years experimentally creatures intermediate from the point of view of their characteristics between the queen and worker bee. This was firstly discovered in the year 1919 at the Izmailowo Experimental Station in artificial queen-rearing. In 1924 Professor Koshevnikov succeeded, by decreasing the amount of food in the queen-cell, in producing true intermediate forms between the queen and the worker bee. (See G. A. Koshevnikov's "Ptchelowodnoje Djelo," Moscow, 1925, "The Variability of Queens and the Problem of Race Breeding in Apiculture".) It became clear that the beekeeping literature contains many descriptions of small, "strange" queens. But Professor Koshevnikov was the first zoologist to describe these creatures, not only from the point of view of their external characteristics but also the structure of their internal genital system.

The last discovery was described in Russian and could only reach Europe after the civil war, by which time some of Professor Zander's work had been accomplished. I mean the work of F. Becker, "Bienenkönigin und Arbeiterin als phänotypische Erscheinungsformen," and of Zander, "Die Königinnenzucht in Lichte der Beckerschen Untersuchungen," (Erlanger Jahrbuch für Bienenkunde,

Bd. 3, 1925). The work consisted in taking larvæ of different ages in queen-rearing and in studying the peculiarities of the mature queens obtained in these ways. Besides ovaries and spermathecal vesicles, there were studied also the mandibu-



Fig. 2. Reproductive system of the worker bee. Where the oviducts meet, can be seen the rudiment of the spermathecal vesicle. After G. A. Koshevnikov.

lar and pharyngeal glands. These glands are very differently developed in queen and in worker bees. I shall not touch on the last two characteristics, because the problem is satisfactorily clear from the description of the change in genital system only.



Fig. 3. Rudiment of the ovary of a sealed larva. The band connected with the concave part of the rudiment represents the future oviduct. The two other bands are tissues which gave origin to the ovary rudiment. After G. A. Koshevnikov.

The age of larvæ which were transplanted in artificial queen-cells was determined in the following manner: In the spring in the middle of the nest a frame was inserted with empty drawn combs. The cells were

filled by eggs during the next 12-24 hours. Adding 66-69 hours (the time required for the embryonal egg development), the authors were able to know the moment of larval hatching. Larvæ of different ages were transferred to queen-cells and the bees were allowed to nourish them as queen larvæ. When the cells were sealed they were transferred to an incubator at 34-35° C. The pupæ were taken for further investigation when their chitin began to turn yellow. The material was fixed in (80° C.) hot water and preserved in alcohol. The pupæ were then cut in transverse sections by means of a microtome and on sections so obtained was determined the number of egg tubes in the right and left ovary, the length and width of the section of the ovary and the diameters of the seminal vesicle. Table I shows the most important data obtained by Becker. All the measurements are taken at the end of the pupal stage. The length of the development must be understood in this manner: The first number shows the age at which the larvæ were taken from the worker-cell and transferred to the artificial queen-cell; the second number, the time of feeding in a queen-cell.

The fact that the 3½-day-old larvæ have given origin to such variable queens from the point of view of their feeding in the queen-cell (eleven, nine and eight days) and physical characteristics can be explained by the well known fact that larvæ situated side by side on the comb differ greatly in size and stage of development. Therefore the larger ones give creatures characterized in the fifth line of Table I, and the smaller ones, those of the third line, nearer to the queen type. The table shows with perfect clearness that the larvæ which are younger than three days produce queens which cannot be distinguished in any way (excepting probably a little smaller size of seminal vesicle) from natural swarm queens. The first indication of the characters of the worker bees can be observed only on larvæ which are older than three days. I must call attention to the creatures of the third and fourth lines in Table I. They are intermediate between the worker bees and the queens and are very probably, judging by the number of egg tubes, identical to the bees described by Professor G. A. Koshevnikov.

Dr. Becker did not draw any practical conclusions from his discovery. It is done in the article of Professor Zander, printed in the issue of the publication cited above. The latter author adds also some material relating to queens of different origin. His data show, it seems, that the queen artificially reared from com-

TABLE I

Time of development	Number of egg tubes in one right ovary	Large diameter of right ovary in mill.	Small diameter of right ovary	Length of the spermathecal vesicle in mm.	Width of one spermathecal vesicle in mm.
1. Swarm queens	154.5	1.84	1.09	1.06	1.04
2. Stage 3-8 days	159.5	1.64	1.19	0.91	0.92
3. Stage 3½-11 days	47.0	0.93	0.73	0.66	0.61
4. Stage 3½-9 days	37.7	0.53	0.68	0.57	0.50
5. Stage 3½-8 days	6.5	0.16	0.13	0.125	0.16
6. Worker bees 4-7	3.6	0.08	0.07	0.18	0.097

paratively old worker larvæ are lighter. (The 2-day-old larvæ give queens with average weight 0.189 gr. based on weighing six specimens; the 2½-day-old, 0.176 gr., four queens for each larvæ age.) Professor Zander shows that the most important point in the work of Becker is that which shows that there is no difference between swarm queens, supersedure queens and those artificially reared from comparatively young larvæ. The same conclusion based on a careful study of the genital system of queens of different kind was drawn in the year 1896 by Professor G. A. Koshevnikov, in his work published in the "Proceedings of the First Russian Beekeepers' Congress." The second conclusion of Zander is that it is perfectly safe to rear queens from 2-day-old worker larvæ, although it is more successful to do that with 1- and 1½-day larvæ.

I must also mention some very interesting data obtained by Dr. Gotze and communicated by him at the Pan-German beekeepers' meeting in Ulm, August, 1926. (Zur Zuchtungsbiologie, Variabilitätsstudien an der Honigbiene, Preussische Bienenzeitung in Mohrungen, 1926, N. 9.)

The experiment consisted in putting in a colony which was nine days before deprived of its queen a frame with young (evidently one day old) brood. The frame had square windows in the comb. On the edge of these windows the bees built true queen-cells. Fourteen days after, the

queens emerged and the author removed them immediately from the hive. The colony received again a frame with young brood. Dr. Gotze succeeded in repeating this operation six times at fourteen-day intervals. The results are shown in Table II.

We can see that the number of queens decrease in each consecutive operation. As early as the third, fourth and fifth operations few misformed queens could be observed. The single creature of the sixth operation was lighter than a worker bee, the color and the hairs were those of a queen, the head and the legs were of a worker type. We have here certainly the same intermediate form between the queen and the worker bee which was described by Professor Koshevnikov. It is interesting to note that the temperature in the hive was all the time near 32-33° C., although in the absence of brood only a little lower than in the normal colony (34-35° C).

Gotze believes that rearing of normal queens can be done only by nurse bees which are not older than a certain number of days, and which became more and more scarce in the colony deprived of an egg-laying queen. The practical conclusions of Dr. Gotze are as follows:

1. We must not compel a colony to rear queens many times in succession.
2. We must choose for queen-rearing only colonies which are well developed and rich with brood.

TABLE II

Number of the operation	I	II	III	IV	V	VI
Number of queens of the given operation	42	23	12	2	1	1
Average weight of queens in grams	0.197	0.181	0.178	0.150	0.109	0.082

Amoeba Disease of the Honeybee Found in the United States

THE following has been sent to us from the Official Record of the Bureau of Entomology of the U. S., Department of Agriculture, by the author of the item, Dr. J. W. Bulger, on a newly discovered disease of the adult bee: (Editor.)

Another parasite causing disease in the adult honeybee has been found in the United States. The writer found cysts of the parasite causing the "amoeba disease" of the honeybee in two colonies of bees in the apiary of the Division of Bee Culture Investigations, Washington, D. C., on January 31 and February 3, respectively. This parasite was discovered in Europe about ten years ago, and since that time it has been observed and studied by several other workers in Europe, but it has never, so far as known, been reported in the United States before.

Very little is known concerning the economic importance of this disease. However, since Nosema is at present the only commonly recognized disease in the adult honeybee in this country, the establishment of the presence of another disease-causing parasite is of considerable interest.

The parasite causing the "amoeba disease" of the honeybee was discovered by Dr. Albert Maassen, a German investigator, about 1916 and has been studied by him and by other workers since that time. Dr. H. Prell of Germany in 1926 suggested the name *Vahlkampfia* (*Malpighamoeba*) *mellifica* for the parasite and also the name "amoeba disease" for the disease. This organism is found chiefly in the malpighian tubules of the adult bee. (These tubules are excretory organs which probably cor-

respond in their function to the kidneys in vertebrates.) The writer found for the most part only cysts, but in some cases saw a form slightly larger than the cysts and closely resembling them. This is probably a vegetative form, since it does not have double walls as do the cysts. Where the tubules are heavily infected they are considerably distended and have a somewhat glassy appearance and are packed with round to slightly ovoid, almost transparent forms, which are, if cysts, from 5u to 7u in diameter. In cases of heavy infection the epithelial cells of the tubules were found to be considerably altered.—By J. W. Bulger, Assistant Apicultural Physiologist, Bureau of Entomology.

Manitoba Honey Crop

Sweetest story ever told by Manitoba farmers is the tale of this year's production of 7,386,575 pounds of honey in the province, an increase of more than 100 per cent over the 1926 production.

Average production throughout the province, according to L. T. Floyd, Provincial Apiarist, amounted to 171 pounds of honey per colony of bees. Approximately 2,500 beekeepers reported their yields.

Manitoba, with its plentiful supply of honey-producing flora and abundant sunshine, leads the prairie provinces of the Dominion in beekeeping, and this year's crop is the greatest recorded in its history. In 1925 the average production per colony of bees in the province was 150 pounds with a total of 4,107,120 pounds.

Production last year declined considerably, with a yield per colony of only 115 pounds and a total production of 3,522,512 pounds.

The farmers' sweetest story, however, is not yet ended. Already more than half of this year's production has been sold and prognostications are that prices for honey will go up with the new year.

Watson's Work in Farm Press

An article on Watson's work on controlled mating of queenbees appears in the February 4 number of the Farmer's Guide of Indiana. The article was prepared by J. J. Davis, of Purdue University.

The beekeeping fraternity has been asleep in getting publicity in newspapers, farm papers and magazines. The subject of bees and honey is an alluring one.

We might well boost the interest in our industry and thus create in the minds of readers another link which would make them call for honey on the table.



The oldest Bee Journal in the English language. Published monthly at Hamilton, Illinois. Copyright 1928 by C. P. Dadant

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C. P. Dadant, Editor; Frank C. Pellett, Associate Editor.
Maurice G. Dadant, Business Manager

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More About Water-Formalin for Foulbrood

Let us conclude our editorials concerning the solutions for treating combs, with another letter from Mr. W. Sheron. Here it is:

"In our correspondence on the subject of water-formalin, you suggested that I write Mr. A. P. Sturtevant, the author of the government bulletin on the sterilization of American foulbrood combs, in which he recommends the water-formalin solution as superior to all others. I did write him, as you suggested, and in my letter I gave him the new formula of the D. & B. Chemical Company—the same formula which I quoted in my letter to you and which you incorporated in your editorial in the February number of the American Bee Journal. I refer to the use of salt in the solution and the changing of the mixture from four to five parts of water to one of formalin. Mr. Sturtevant wrote me as follows:

"* * Before replying, I made up some water-formalin solution according to the new formula of the D. & B. Chemical Company which you enclosed. * * I put some of this solution out of doors to see whether it would freeze or not. The temperature must have dropped to near zero while the solution was outside, but it did not freeze, so I think the addition of salt to the solution will prevent your solution freezing if it has to stand in a cold place. In regard to reducing the amount of formalin in the formula from one part of formalin to four parts of water, to one part of formalin to five parts of water, I have no definite information that I can give you. However, I feel that it would be much safer to use the

stronger formula. This will allow a margin of safety which may not be present when one part to five are used. Until I have made further tests I would not care to make any other recommendations."

"I mixed my solution with the salt, but did not change the ratio of water and formalin from the old to the new formula. It has stood a temperature four below zero without freezing. These facts should be read in connection with the editorial in the February Journal."

Differences in Localities Bring About Differences in Management

We are too apt to consider everything from our own standpoint, without trying to put ourselves in the place of others and consider their circumstances before condemning their ways.

We have lately seen this very forcibly. A beekeeper living in Europe, in a country where snow is never hard, but always soft and "mushy," condemns our December suggestions, page 616, to allow the snow to pile up on the hives during the worst of the winter, because, as he says, "snow causes infinite dampness." This is true in a country where you can always make a snowball out of the fallen snow. But here, in Illinois, where snow resembles dry sand for weeks and perhaps months in succession, dry snow constitutes a very great protection, in many circumstances.

Again, in the countries where moisture is the rule and there is but little cold weather, pollen which is left by the bees in a comb, in fall, becomes mouldy and is worthless. But in a dry locality, where there is little chance of mould, pollen is often as good in spring, after passing the winter either in the hive or in the honey house, as fresh gathered pollen. So let us not condemn our brother beekeeper's methods without considering his circumstances, which may be different from ours and may cause him to do things that we would condemn in our locality.

Unite Against the Corn Sugar Bill

Bills have been introduced into both House and Senate to legalize the use of corn sugar without its declaration on the label of the products in which it is used. The Senate bill is number 2806 and the House bill is 10022.

The bills are identical in form and provide:

"Nor shall any manufactured or prepared food product be deemed misbranded if such dextrose and (or) levulose be used therein as ingredients without declaration on the label of their presence: Provided, however, That nothing in this Act shall be deemed to permit the insertion of dextrose and (or) levulose by mixing or blending in any article of food sold or offered for sale as honey."

While this bill prohibits any adulteration of honey, still it appears to be a dangerous one nevertheless. Maple sugar and maple syrup are manufactured products and this bill would appear to make it possible to adulterate either with corn sugar. If this bill becomes a law, it might open the way to wholesale adulteration of numerous food products. Even cane sugar might be mixed with that from corn without hindrance.

The American Bee Journal is opposed to any exception in the pure food law in favor of any product, no matter what it is. We contend that the consumer should be fully protected and should know exactly what he is

buying in every case. No honest product will object to being sold for what it is.

We would urge our readers to write to their representatives in the United States Senate and in the National House of Representatives objecting to any weakening of the pure food law. Many beekeepers' organizations have already registered protest against enactment of such a measure, and those which have not done so may well lend their support to the opposition.

Prior to the passage of the pure food law, beekeepers had hard work to realize a fair price for their honey because of the constant competition with various sweets adulterated with glucose which were often sold as honey. Even now there is a very general impression that much of the honey in the market is adulterated. The confidence of the public in the protection of this law is the greatest asset the beekeeper has. Anything which will lessen public confidence will result in injury to the honey producer as well as to the public in general.

The American Bee Journal is opposing the passage of this legislation and is using its influence to prevent any weakening of the present law.

Our Associate Editor, Frank C. Pellett, is in Washington as this goes to press, to do all he can in the effort to stop the passage of the bill.

Honey Needs Advertising

One has but to make a careful examination of a copy of any current woman's magazine to see what is the matter with the honey market. Other food products are extensively advertised. Honey is not. In the keen competition for the attention of the housewife, honey is crowded out of her consciousness.

The February issue of a well known household magazine contains seventeen pages of advertising for food products. A full page in colors is given to Brookfield butter and eggs. These are farm products that once were in the same class with honey. By means of good organization, distribution has been secured which makes both staple products with stable markets. Another full page in color is given to California asparagus. I think that few would contend that asparagus has any advantage over honey in the markets of the world. A third page, also in color, is devoted to canned vegetables such as tomatoes, peas and corn. Still another page in colors calls attention to pineapples.

In addition to these, the merits of ham, jello, cereals, cocoanuts, walnuts, flour, postum, gelatin, Campbell's soup, and baking powder are held before the eyes of the housewife. Bakery products occupy a two-page spread with alluring pictures, and a similar space tells of the use of Crisco in cookery.

In many cases the advertising is supplemented with an offer to send free an attractive booklet of recipes. These booklets are of high quality and offer suggestions for the use of the products in many different ways.

Unless the beekeepers can find means of meeting this intense competition, there is little hope that honey will continue to occupy its former place in the housewife's affections. There are so many things constantly placed before her, with enticing suggestions for ways in which they can be used to add variety to her menu, that she is bound to forget the things which are not brought to her attention.

We are living in an age of publicity, and the industries which are going forward are the ones which use the greatest amount of printer's ink. The individual firms which are making money are in most cases the most liberal advertisers. Some means must be devised of securing the same attention to honey that is given to butter and eggs and asparagus, oranges and raisins. We need an advertising Moses to lead us out of the wilderness.

F. C. P.

Package Bees

If you want package bees from the South and have not yet ordered them, you had better do so promptly, for the orders are always filled in rotation by southern breeders. Have them sent to reach you a week or ten days before fruit bloom. Of course, it will be necessary to feed these bees after receiving them and until the crop is on. Do not be miserly about this and you will find yourself well repaid in harvest. But be sure and anticipate and prevent any robbing, for nothing demoralizes an apiary like robbing. That is why sugar syrup has some advantages over honey, since it has less odor, even if otherwise less desirable.

A properly made shipping case for package bees is usually of a size to go within an ordinary ten-frame hive body. So all that is required to transfer the bees is to open the crate and place it inside of an empty hive body, immediately above a hive full of combs or comb foundation. After the bees have established themselves on the combs, the extra hive body is removed.

Honey from Geranium

On page 490, of our September number, Mr. A. Bernard, of Algeria, stated that the bees were harvesting honey in liberal quantities from the fields of "geranium" cultivated in Algeria for the production of perfume. As

we expressed the desire, in a private letter, of becoming acquainted with this honey, he sent us a sample jar of it. It is of light color and has a perceptible perfume, not strong enough to be objectionable. On the whole, it is excellent honey. Mr. Bernard writes us:

"I should not have called 'geranium' the plant from whose leaves they draw a very perfumed essence. It is properly the 'Pelargonium capitatum' of botanists. It is the same plant as that called 'geranium (Pelargonium)' by John H. Lovell, in the first column of his article on page 623 of the December number. But his assertion that the bees cannot find in it either nectar or pollen would be incorrect here. It is cultivated on a very large scale in Algeria for the essence to be secured from the leaves. You can readily recognize the odor of the perfume in the honey which I sent you. It is discernible, but not too accentuated. It was due to this plant that some crops were harvested this (1927) year in certain regions of Algeria."

We might add to this that the Pelargonium is the plant generally known as geranium among flower lovers.

Mr. Bernard is an old, experienced beekeeper, who has been the treasurer and most active member of the Algerian Beekeepers' Association for years. It was he who sent us a description of the different smokers used by Arabs and called by them "fakrouns," which we published in the American Bee Journal, page 269, of June, 1925. A short biography of Mr. Bernard was published on page 31 of January, 1926, with his photo.

The Development of the Organs of the Queen and of the Worker

The article by Professor Alpatov, of the University of Moscow, in this number, is of serious importance. The experiments he mentions, made by himself and others, showing that the number of egg-containing tubes in each of the ovaries of a queen may be as great at 159 and as low as 6, and that, in all probability this difference depends upon how early the larva was selected by the bees for a queen, indicate that it is of the utmost importance that very young larvae should be used to produce queens, in artificial queen-rearing, if we wish to get the best results.

We already knew that some bees, reared as queens, are unworthy of the name. But this gathering together the experiments of several scientists explains to us why this happens and why some people prefer queens reared under the swarming impulse to artificially reared queens. It evidences to us, however, that it may be possible to rear most valuable queens artificially, if the conditions are properly managed. The conclusion is that the youngest possible larvae must be used in cell cups, none more than three days old. Undoubtedly, also, the requirements of ample food, insisted upon by our friend Jay Smith, are indispensable. Let our queen breeders remember these points, for there is nothing more important, in beekeeping, than the production of high class queens.

The New Government Poster

On page 139 of this issue we give cut and short description of the new government poster for honey, which we consider one of the best things in the honey advertising line for a long time.

What we wish most to emphasize is the unusual opportunity beekeepers have to use this poster, through the opinion of the Postmaster General of the United States, when he states that the Postoffice Department has no objection to such posters being hung, framed or unframed, in local postoffices if the consent of the local postmaster is secured.

The cost of this poster will be announced next month. See your local postmaster and do your bit of advertising for honey.

The Genesis of a Successful Bee Man

By Frank R. Arnold

A BEEKEEPER who has spent five years as a missionary in Japan on the Island of Hokkaido, among the hairy Ainus, who has invented a bee costume that no bee can penetrate, and a roadside bee sign you can see fifty yards away, and who has an extracting truck that travels from apiary to apiary, is a rare figure among bee men and one worth visiting. Such a man is William S. Ellis, of northern Utah. He lives most fittingly in Honeyville, a little village named, however, not for its apiaries and its nectar-bearing plants, but because most of its early inhabitants belonged to the Hunsaker clan, thus receiving a far-fetched, but appropriate, name. It certainly is a happy hunting ground for the bees, for it is a land of apple and peach orchards, of meadows yellow in spring with dandelions, so that there is no lack of spring pasturage, while the fields of alfalfa as well as the many irrigating ditches and two railroads lined with sweet clover supply the water-clear, colorless honey for which Utah is famous.

Mr. Ellis has one thousand colonies scattered in fifteen apiaries along the Bear and Malad rivers, streams that were famous for beaver before the Mormons came to Utah, and now are spread in irrigating canals and ditches over two valleys and thus produce an abundance of nectar-bearing plants and pollen-heavy willows all through the district. Mr. Ellis must be a bee lover by the grace of God, for, although he has a sixty-acre farm of peach orchard, sugar beet and alfalfa fields, he prefers to leave all that to a tenant farmer while he travels from apiary to apiary or works at home while waiting for the wayside customer who is sure to stop on his way from Ogden or Salt Lake to Pocatello,

Yellowstone Park and the Montana country.

When you talk to him first you want to find out "how he got that way," and you learn that as a boy in high school he worked summers with a past master in bee culture,



Honey sign of the Ellis apiaries

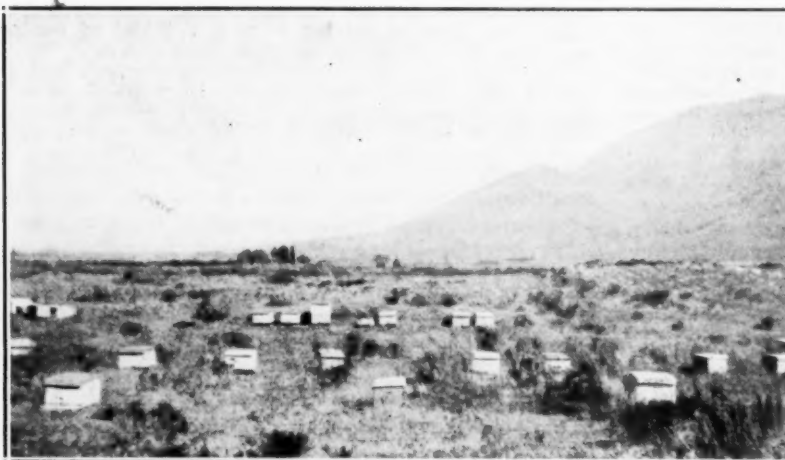
R. T. Reese of Ogden, a man who ranks with the Chantreys, Gills, and Hillmans, those famous Utah bee men, and a man who is rendered so prosperous by the bee that he can winter in Honolulu or southern California. After high school came the mission field, whither Mr. Ellis carried his bee passions and where he found the thirty colonies of bees of the Japanese Agricultural College, on his island, fully as interesting as the hairy Ainus, even if they did not have souls to save. He also visited a high school bee class at Osaka, in southern Japan, and was much surprised to see how the serene, placid, unexcitable Japanese teacher with

his wife and students could circulate among the bees without smoke or veils and yet never get stung.

On his return to America, Mr. Ellis went to work again for Mr. Reese, then worked with him on shares, and finally started in business for himself in the Malad Valley. From Mr. Reese he learned the value of an extracting wagon, and now has a motor truck that with its 1000-pound equipment weighs only 2700 pounds. It was constructed in Ogden especially for him and is covered with canvas which may roll up at the sides on hot days and thus give a cool work room. The boxes of comb are run in from the rear and out at the rear. After the capping and extracting, the honey flows into a low tank under the front seat, whence the strained honey makes its exit into five-gallon cans outside. It is compact, convenient, and light, and admirably planned for efficient work.

Mr. Ellis inherited the truck idea from Mr. Reese, but his road sign and his costume are of his own invention. The roadside sign is a wooden hive twice as large as life, set on a framework above the road, with a sheet-iron disk above all, bearing the legend "Honey for Sale," painted all around. It must be a good sign, for one summer it sold \$1,000 worth of honey. The costume is constructed by Mrs. Ellis, who makes a loose shirt of bed-ticking or kakhi, which she sews at the neck to a circle of fine wire gauze about the size of a cheese box. The top is of wood, with a pad to make the head comfortable. This shirt is tucked into the trousers, has rubber bands at the wrists, and is worn with gauntlet gloves, and no bee has ever been known to storm that fortress, no matter how great her desire or her provocation. To make the defense complete, the trousers must also be tucked into high boots.

If you visit Mr. Ellis, he will take you out onto the barren mountain-side and show you one of his apiaries. He always scatters the hives about for ease in working and to prevent any possible mixing of queens. He will lament to you the fact that no Utah plant breeder has yet found a nectar-bearing plant to supply spring pasturage on the dry, unirrigated mountain slopes in addition to dandelions and orchards. In winter he puts his hives close together, covers them on top and behind with straw and covers the straw with mud. This leaves only the south side exposed, and as each hive has a round auger inch hole covered with a diamond-shaped, movable piece of



Apiary under blue sky with rising background

galvanized iron, there is always an exit for the bees even if the usual entrance is covered with snow. In this way Mr. Ellis has usually a winter loss of only 10 to 15 per cent. He thinks, however, like his neighbor, N. T. Spangler, that winter loss depends more on the strength of the queen than on cold and if he were more particular about requeening in the fall his loss would be less. Mr. Spangler requeens each fall the queens of the previous year and never has a loss of more than 2 per cent.

Mr. Ellis' honeyflow in 1927 was not so good as in 1926, when with the blooming of the second crop of alfalfa early in July many of his colonies registered a daily increase, for a month, of from eight to ten pounds. Those were halcyon honey gathering days when climatic conditions were just right, with cool nights and damp, warm, windless days. That year he averaged ninety pounds to the colony, and this year only sixty. However, his colony increase this year was over 50 per cent, the apiary near his home showing an increase from twenty-four to fifty-three colonies.

The genesis of the bee complex in Mr. Ellis thus shows a remarkable range, as he learned his trade in high school vacations, he acquired oriental calm in the mission field, and, like all good business men, he shows initiative and originality in his handling of bees. He says he inherited most of his bee ideas from his boyhood employer, but a wife and native ingenuity have contributed much to the original inheritance. No two libraries are ever alike, and just as you can find some distinctive book in each one that has been gathered together by a distinctive individuality, so you can learn much from every bee man who takes his work seriously and loves it as the bee loves sunshine and nectar.

Is the Bee Warm Blooded?

By W. T. Scott

WHEN an authority like Dr. Phillip makes an emphatic assertion, he is a rash man who would venture to dispute the matter. It is therefore with the greatest diffidence that I venture to question the reality of those truths which, in the December number, Dr. Phillips says "every beekeeper knows." These are that at a temperature lower than 50 degrees a bee cannot alight without straightway losing its power of flight, and that bees alighting on the snow lose even the use of their legs and are unable to return to the hive. I can only say that my own observations have been very different.

For instance, one day last year, the shade temperature being near

freezing point, so that the snow, which had fallen the previous day, was neither slushy nor yet very dry and powdery, I spent a little time watching the bees to see how great the danger might really be. There



A bee suit made to allow rapid work with little need for attention to stings

was a feeble sun shining, but apparently just strong enough to create an imperceptible film of moisture on the surface of the snow, for numbers of bees were alighting on the snow and busily engaged in sucking up this water. They would stay for a

minute or two, long enough to collect a good load, and then, rising easily from the snow, fly back without the slightest difficulty to their hives.

A slight breeze was blowing and it occasionally happened that a bee, losing its balance, would be driven sideways onto the snow, sinking slightly into it. Such bees were instantly immobilized, and were never able to return, but their numbers were small, and the great majority wandered over the snow in complete security. Though I watched for some time, I never saw one, which having safely alighted on the snow, afterwards get into the least difficulty.

If a bee, whose muscles are so completely paralyzed by cold, is nevertheless able to remain for an appreciable time on the snow and retain full power of movement, it would seem to show that the honeybee is, to some extent at least, warm blooded.

Scotland.

Two Hundred Pounds of Honey Found in Church Wall

Forest City, Mo., Jan. 31.—Two hundred pounds of first-class honey was removed from the walls of the Christian church here today.

Three swarms of bees had made their homes in the walls of the church and had annoyed church services at times.—St. Louis Globe-Democrat.

Apiary of Geo. Sauer, Polo, Illinois

A ship-shape apiary in strictly modern garb, yet it reminds one of the days when the brilliant galaxy of bee lights were setting the paths for us to use. The hives are provided with frames resembling the old American size, originally credited to F. A. Snell, of Milledgeville, Illinois, but I suspect really adapted by him from the arguments of these early disputers concerning hive size.

The Sauer yard, however, is an evidence of the fact that after all the beehive is merely a tool in the hands of the beekeeper. He has a system as good as any and the hive seems novel to outsiders only.



Selection of Breeding Queens

By C. P. Dadant

ONE of our subscribers asks that the editor give his views on the selection of breeding queens. By "breeding queens" is meant those from which queen-cells are to be produced for colony increase.

There are a number of important points to be considered in the selection of breeding stock. As a matter of course, the production of large crops of honey being the ultimate aim of each one of us, the queen whose progeny will harvest the largest crop will be considered as the one from which to secure our breeding queens. But there are other points to be considered. Gentleness in the workers is a very important matter, if we live within the limits of a village, for it is exceedingly unpleasant to see your neighbor out of humor with you because your bees sting him or his children.

Then there is the question of permanence in results. If our best queen is of thoroughbred stock and purely mated, it will be likely that her daughters will follow her in results. But there are many instances where the bees of an impurely mated queen harvest the largest crop. Should we select this queen to breed from, we might find altogether different results in her daughters. Besides, impurely mated bees usually produce irascible progeny. It is a fairly well proved fact that the temper or disposition to gentleness or irascibility comes from the male. Therefore the bees of an Italian queen mated with a drone of the common race are likely to be of irascible disposition, although they may be very active workers. A similar result is to be expected from either a Caucasian or a Carniolan queen, mated with a common drone. This sort of mismating is more difficult to detect than the mismating of an Italian queen, because of the greater similarity in appearance between Carniolans or Caucasians and the common bee than of the latter with the Italian, owing to the yellow rings of the Italian.

Another point of importance to consider in the breeding queen which we select is the greater or less propensity of her bees to swarm. The Carniolans are greater swarmers than other races, and this is said to be due to their having been kept in diminutive hives for centuries. Whatever be the cause of this proclivity, it is not a desirable quality, if the bees are managed so as to avoid giving a cause for it. What we wish in our bees is a tendency to yield to our wishes. If we keep large brood chambers, plenty of supers at the time of harvest; if we

supply ample ventilation in hot weather, shade from the hot rays of the June sun, young queens and few drones, we should secure a race of bees which will have little tendency to colonize against our wishes. It is much more satisfactory to make what increase we want, out of the stock that we may select, than to have our colonies swarm at short notice. As a matter of course, we cannot expect the bees to shirk and remain in an overcrowded home at a time of harvest, if we do not look after their needs, and a non-swarming breed cannot be expected to exist if the conditions are not made satisfactory during the crop.

There are other matters of less importance in the selection of a breeding queen, such as color, shape and size. An excellent queen will be likely to be of large size and well shaped. If she is purely mated, her bees will be uniform; but to us a golden yellow color in either queen, workers or drones is not at all a criterion of quality. In fact, I have seen more disappointment in the selection of beautiful stock, regardless of other qualities, than in any other matter.

As stated by Dr. Miller, in his books, "Forty Years Among the Bees" and "Fifty Years Among the Bees," "a queen which has a fine record for two successive seasons is preferred to one with the same kind of a record for only one season." This goes without saying, for regularity is important.

But is the selection of the queen which is to supply us with brood for queen cells the only requirement in the breeding of good stock? I believe there has been much less attention paid to the drones than to the queens. The main reason of this is that we do not positively know whether our queens will mate with drones of our choice. Yet, we can have a great deal of influence upon this question, if we secure choice drones. Not only will there be a chance of some of our queens, at least, mating with these choice drones, but there will also be a likelihood of the bees of our neighbors being favored in that way. This will redound to our benefit very soon, since the drones produced will be likely to mate with our queens. It is well to bear in mind that one's neighbors may not be as careful about cutting down drone production as we are, and therefore it is of great importance that the drones produced by such neighbors' bees be of good quality. So, although it is quite important that our inferior colonies be deprived of the ability

to produce drones as much as in our power, it is also important that we should have a goodly number of drones in our best colonies. This is secured by inserting drone-combs in the brood chamber of some of our best queens. But we prefer to rear our drones and our breeding queens from different colonies, so as to avoid in-and-in breeding.

If we wish to rear early queens and have them purely mated, let us rear our drones early, by feeding the colonies that are designed for this purpose; then we can rear early queens and will have the best opportunities of having them purely mated.

There have been complaints, of late years, of Italian bees of less activity than formerly. Is it due to carelessness in selection, or to too much in-breeding for the sake of color? It is quite possible that we will have to return to importations, from time to time, in order to retain the high producing qualities which we have long known and praised in the race.

Meanwhile, let us carefully note the honey-producing qualities of our colonies, so as to select the very best for the reproduction of the race.

Letter from Manitoba

I often see in the journals that come to us from your side of the international line a lot about the tremendous crops of honey that are produced in this northland. We do get good crops of first-class honey, and we used to think that we were on the road to riches, as at one time we had no competition, except from far-off Ontario, where the freights cost them 3 cents to get it here. That gave us always an advantage, but now overproduction has arrived, which means low prices and poor markets; in fact, there are some producers at the present date (January 13) that have 80 per cent of their crop on hand, and likely to have for a while.

We also have to pay considerably more for our supplies and containers than our cousins to the south of us; I think I might safely say 25 per cent. We have to feed heavily on sugar syrup in the fall to bring our colonies through our five months winter, and often have to feed heavily in the spring to stimulate our bees, sometimes in late May and early June. We are a sparsely populated country and we have yet to educate our people to consume honey as a food. Many look on it as a luxury only.

We are almost free from bee diseases and are very fortunate in

having a live wire as provincial apiarist, who is very much alive if he hears the words "foulbrood," and we beekeepers owe quite a lot of gratitude for his untiring efforts to keep down this bad disease.

Yes, this is a bee paradise, with tons of nectar ungathered every year, but it had better be wasted in its raw state than be spoiling in our honey houses, enclosed in high-priced containers.

Portage Apiarist.

New Uses for Beeswax

In the October issue of Scientific American there is a very interesting letter from R. W. Porter, in which he tells of the results obtained by A. W. Everest, of Pittsfield, Massachusetts, in polishing lenses by means of comb foundation. The following extracts are quoted from the letter:

"Newton, in the seventeenth century, found that properly tempered pitch served admirably for a bed on which a finely-ground glass surface could be brought to a complete polish, and it is still used for polishing and figuring optical surfaces, such as lenses, prism, flats, et cetera. However, making a pitch lap is somewhat of a trial to the amateur and has been adequately described as a 'mussy' job.

"It is here that the humble bee comes to the rescue. Apiarists are now using what they call a 'comb foundation' which they place in the hives.

"My first surprise on trying this novel polisher was the perfect uniformity with which the glass began to polish. It would seem that the structure of this comb foundation provides a cushioning effect that gives uniform contact with the glass from the start. The tiny wax partitions making up the hexagonal pattern slowly spread under the pressure and heat of polishing, accelerating the polish as the work progresses.

"As the last pits disappeared from my test disk (five inches in diameter), I looked at the clock and was astounded to see that the glass had been brought to a complete polish in about two hours. When it is understood that seven to nine hours are usually required to polish on pitch, no further comment is necessary.

"When the speculum maker has polished his mirror, he 'figures' it; that is, he laboriously wears away parts of the glass until it reaches a surface of revolution known as a paraboloid. To accomplish this, certain parts of the pitch lap are cut away in order to bring the abrading action upon the part of the glass where it is needed. For the amateur this means perhaps that he must make over his lap several times, each

time going through the 'mussy' job previously alluded to.

"With comb foundation, however, any desired lap may be cut out and used, stripped off the tool and another quickly substituted. The sheets adhere readily to the tool if the tool is first smeared with turpentine and any excess wiped off. The sheets come in rectangles 7 by 14 inches and cost about 12 cents apiece. I had no difficulty in obtaining them of a beekeeper in my community, and I imagine they are equally available elsewhere. For mirrors over seven inches in diameter, two sheets may be joined, or butted, and a lap built up to any size required. Moreover, they may be built up one upon the other to any desired thickness.

"Withal, no better medium could have been designed for convenient and efficient mirror polishing than this product of the beekeeper."

In a letter written to Mr. H. C. Dadant of our staff, in answer to an enquiry, Mr. Everest commented as follows:

"Our work requires accuracy to within a few millionths of an inch. This means absolute contact between tool and glass. Up until recently this was accomplished by using a pitch tool, which, under pressure of polishing, would gradually change its shape and maintain good contact with the surface of the glass as it changed during the various stages of polishing and figuring.

"With the wax tool, a different action takes place. It being non-viscous, we have to depend upon its wearing down to maintain the necessary contact, and the surface of comb foundation happens to be just right for this purpose."

Unselfish Devotion

Jes Dalton writes: "I am glad that you people are well pleased with the way we handled the reconstruction bee work. Some of us had, first of all, the success of the work at heart, and did long, weary hours of work to make it a success, often accomplishing things that were extremely aggravating to do.

"But there is one man, who was not a beekeeper, whose personality and unceasing toil made that program go. This man was W. E. Anderson, State Entomologist, 'and don't forget that.'"

Yellow Bees Again

I have read the article on yellow bees by Mr. C. A. Bird. I will say that a golden queen that produces six yellow bands, mated to a black drone, will produce three yellow bands, and a pure Italian queen of imported stock that produces three yellow bands, mated to a black drone,

will produce one and one-half yellow bands.

I have been using the Manum winter case for about fifteen years, and I have noticed on a hot day that the bees suffer most in single-wall hives if they stand in the sun, but on a hot night the bees in a packed winter case would suffer more, as the single-wall hive would cool off quicker. If the packing was taken out, about the middle of May here, I believe the bees would not swarm so much. I have an entrance at the bottom 2x8 inches and a bee escape hole open at the top. My bees seldom hang out. My bees had a flight here yesterday, as the mercury was up to 50 degrees.

Victor G. Berrian, N. Y.

Honey Exports

We have mentioned several times in our columns the very desirable work that is being done by the Department of Commerce at Washington, and the help of the Division in Bee Culture, in boosting exports of honey, by seeking the foreign markets.

This is exemplified by the recent report of the Market Bureau on exports for the calendar year, just issued.

Exports for 1927 were over twelve million pounds, compared to less than eight million pounds in 1926.

This surplus, thrown on the domestic markets, would be enough to make a considerable fluctuation in price.

Illinois Association System

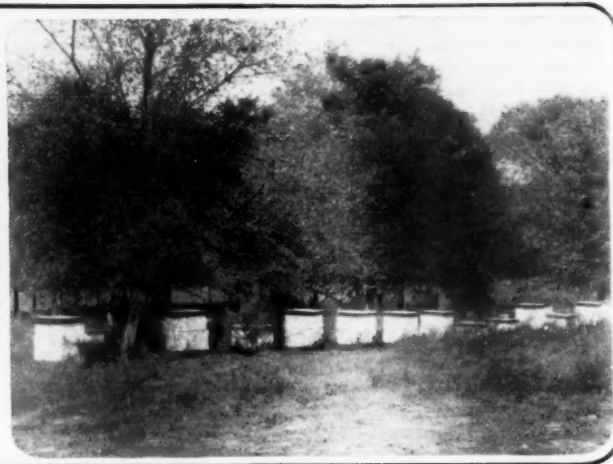
The Illinois Beekeepers' Association has one president, but six vice-presidents, appointed with the idea of having a working force. These vice-presidents are chosen from different parts of the State, and are expected to co-operate with the county associations in that part of the State in putting over association projects.

In our January issue we mentioned V. G. Milum, of Urbana, Illinois, as the new secretary, but failed to mention as a new vice-president Mr. A. E. Mackelden, of Jerseyville, appointed solely because of his past activities for better beekeeping in that section.

Walsh Sells

W. A. Walsh, the prominent queen breeder of Globe, Arizona, says he is "out of the business" for the present and has sold his bees to J. H. Bennett, of Safford, Arizona.

There is that irresistible "urge" to one who has ever kept bees which makes us wonder whether Mr. Walsh is out "for keeps."



Two of Eby's apiaries. Note the sheltered location of the one at the left. It is beside the bank of a small stream and a bit below the level of the fields. An ideal location where no winter packing is needed

This Business of Producing Honey

An Interview with Alan Eby

By G. H. Cale

IN the Beekeepers' Item for October, H. F. Wilson writes a message which should weigh heavily in the minds of those who depend upon the production of honey for their main income:

"Should we find that we are going to be compelled to sell honey at the low price of six or seven cents a pound, the commercial beekeeper must learn to produce a maximum crop with a minimum of labor and expense in order to survive the conflict."

Like every other business, beekeeping comes in for its share of condemnation from the efficiency expert. Those lines of business showing a consistent profit today are the ones that have studied production costs sufficiently to insure maximum production at the lowest possible expense.

Not so in beekeeping. We have been content to travel along in the way of our ancestors and few beekeepers know how much it costs to produce a pound of honey. Few beekeepers know whether a wholesale market price of 6 or 7 cents is in keeping with what they have to pay out to produce the crop. Mr. Kjosness, manager of the Mountain States Honey Producers' Association, recently made the statement that it costs western producers between 5 and 6 cents to produce a pound of honey.

If that is true and it is representative for the country as a whole, it is time we turned our attention seriously to reducing the figure. Here and there are a few forward looking beekeepers who have already taken

steps to remedy the situation. Notable among them is Alan Eby, of West Elkton, Ohio.

During an eastern trip, in September, I had occasion to visit Mr. Eby



Alan Eby

at his home. He is typical of the younger men coming into beekeeping today, bright, alert and business-like. They see things as they are and not as they were in the past. If Eby has one governing maxim, it is this: to produce as much honey as he can at the least cost.

The country around West Elkton is well adapted to commercial beekeeping, is gently rolling and cut with numerous small streams which feed the Ohio River, insuring a fair amount of land not profitable for farming and abundant in nectar and pollen-producing flora. The soil is sweet and the growing of sweet clover has found a place in the farm rotations, giving a fair amount of this plant to support the native forms. Alsike clover is also abundant and common white clover does well. The beekeeping locations are fairly well occupied, although there are some places in this part of southern Ohio where there are yet few bees.

Eby grew up on his father's farm, but became afflicted with bee fever when a lad of fourteen. His father gave him enough capital to buy a few colonies, and from this small beginning he has gradually increased until now, at the age of 27, he has about one thousand colonies, with an ambition to increase considerably beyond this number.

The Eby apiaries are located in several directions from the home in West Elkton, usually on farms near the streams in sheltered spots, well provided with windbreaks. There is no yard at the home, where the central extracting plant is located.

The central plant is well equipped with power extractors, power uncapping knives, settling tanks, arranged for quick and convenient work. Every detail of equipment is studied to save time in operation and in handling. Eby employs two men who work under his direction. He pays them well,

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as well as factory help, and he means to get back that pay in well directed work.

I asked Mr. Eby to give us an outline of his system of management, and it follows in his own words:

"We have adopted large hives in all our apiaries. There are several reasons for this. A big hive is simplicity itself. The supers and brood nest are distinctively set apart and in a definite location at all times. We do not have to shift hives and tear them apart as with other methods. It greatly reduces the cost of production.

"This is our experience from several years of honey production, with several hundred of the large hives along with some bees in standard hives, through lean and fat years, swarming and non-swarming years. In our locality, we have not been able with any method to control swarming with the standard hive without an enormous amount of manipulation. We can work on an average of three times as many colonies per man in the large hives because we really have no swarming problem.

"Very early in the spring, we inspect all colonies for the condition of queens. Nothing further is done until after fruit bloom or the opening of the clover flow. We then put on a super of combs, without excluders. This is about swarming time, or early June.

"In about ten days we add a second super where needed and look through the brood nests for cells, finding an average of about one colony in every three with cells. We destroy these and mark on the back of these hives the letter C. At this

time, if any queens are found in the supers they are put below an excluder. Where none are found above now they are not likely to be found there later.

"When we return on the next trip to see how super work is progressing, we again look through the brood nests and many colonies are found to be into the flow and past cell building. Nearly all not having cells the first trip are found not to have them later. We pass up all such colonies as safe for the season and attend to supering only, giving the colonies no more attention in the brood nests.

"About half of the original colonies with cells have started no more. Those that have, which is about one out of every eight or ten of the total number of colonies, we find have supersedure cells. Replacing with new queens entirely stops further trouble. If we do not replace, we find that we have, on an average, about four colonies per yard of fifty that do swarm. We know this because of our records on the back of each hive.

"We use our queens two years, keeping their wings clipped, and on requeening we seldom find over four

or five new queens per yard. These may be from supersedure as well as from colonies that have swarmed, although we often have had a good crop from these hives. We find also that about as many yearling queens fail as those of two years old.

"We requeen with cells, beginning at the peak of the honeyflow and continuing through till November. We follow up with caged queens to put in where the cells have failed. Where these fail we use three-frame nuclei to set in the queenless hives in place of three or four frames taken out.

"We use Hoffman frames for supers because they fit all extractors, are cheaper per square inch of comb than shallow combs and it takes a less number of them. In the big hive, we again have a cheaper hive per comb surface than a divisible hive, with only eleven combs to handle instead of eighteen or twenty, one brood body instead of two, and it does not have to be lifted to the top of the hive.

"Another great advantage that I believe is little realized in the production of extracted honey by this system is that little pollen is ever stored in the extracting combs, as we raise no brood, a great advantage with the modern radial extractors. Combs raised from the brood nest often have pollen in considerable quantities in them and it induces the bees to store more in the neighboring empty combs while brood activities are still going on in the super, or what often becomes the super at the end of the season. These combs often have some fall honey stored in them also.

"We notice, when we



Center top. Apiary on the estate of former Governor Cox, with all the bees in double-walled hives. Bees are in orchard on a slope and so some protection with packing is needed. The double walls with packing between solves this problem and eliminates the work of fall packing entirely and of unpacking in the spring.

Lower pictures show the farm buildings and the home on the estate of Governor Cox



Honey house and huge outdoor settling tank, located at the Eby home in West Elkton. There is no apiary here

have Demareed or manipulated our ten-frame colonies to prevent swarming, they immediately fall back of the big hives in super work, for several days, then they go along the same. This way of swarm prevention is considerable of a shock to a colony.

"Our honeyflow starts about June 1 and ends about July 20, as far as surplus is concerned, with a height of about fifteen or twenty pounds per day at the peak. There is usually a fall flow from aster and goldenrod, but no surplus. We will enter the honeyflow this coming year with over one thousand colonies. Two men care for all of them. I am on the Ohio apiary inspection force and away much of the time.

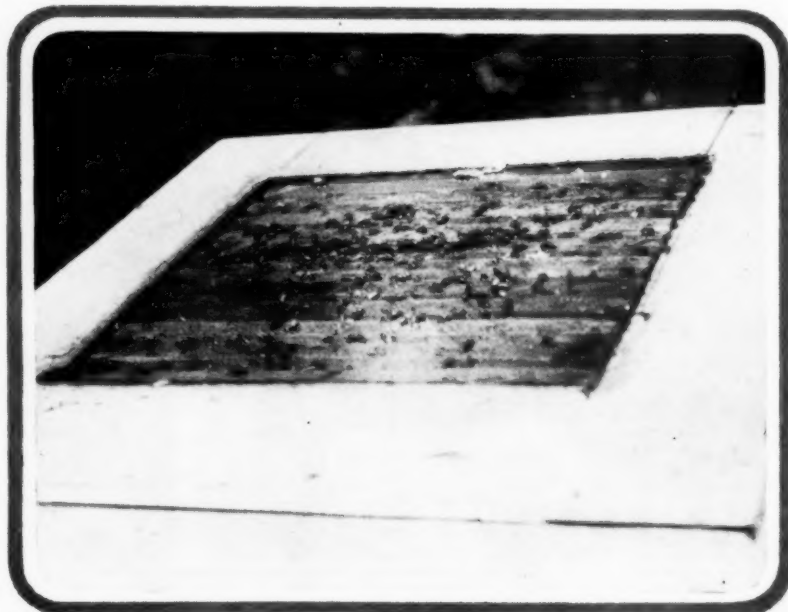
"We use package bees from the South for increase, and the packages this season averaged one hundred pounds of honey. We use three combs on installation, with the balance foundation, and usually feed two ten-pound pails of syrup.

"We have never fed one hundred pounds of sugar in the fall during our entire beekeeping history, and have never had a dozen colonies run short of stores. We sometimes take combs from the heaviest colonies and give to the lighter ones. In keeping bees in a large way for eight years, there has never been less than a seventy-five-pound average.

"About one-third of our hives are double walled. Some we wrap and pack in tar paper, and with some we are experimenting, using about four layers of cardboard, cut from supply cartons, under the cover and closing the entrance down. So far these colonies have made as good an aver-

age as the others. We find the deep hives winter far better under all conditions than the smaller hives under like conditions.

"We make it a point to use as large units as advisable and to handle materials and work the same way, thereby reducing production costs. While we should work for increased prices, we must force production costs to the lowest point, thus enlarging our field and bringing about better conditions. If the honey business is to be greater, we must have a vast increase in production at a minimum cost."



Eleven frame, modified hives, with double wall and packing. It protects, winter and summer, and requires little labor

From Eby we get the preceding account of his operations. But to get the fashion in which he has controlled his overhead expenses, devious small reductions here, a few drastic changes in handling there, one must see his plant in operation and follow through the work.

Two plans he has adopted appealed to me strongly. In keeping track of the expenses of apiary work, I have found that the cost of taking off a crop of honey and getting it into containers is a large item, much larger than is justified. Eby has reduced it greatly. For him the bee escape and the bee brush have almost been relegated to museum equipment. He has little use for them.

Locality has some influence on the plan he has worked out for taking off the honey. The main flow from clover usually ends at about the time the fall asters begin to bloom. There is little break between. So it is safe to leave extracting until most of the honey crop is on the hives.

Then the trucks are started to the yards to remove supers. Most of the bees are smoked out, easy when honey is sealed at the end of the flow. With some nectar still coming in there is no robbing. The few bees left in the supers can still be saved. The honey is taken to the central extracting plant and there piled for extracting. The bees carried in soon fly to windows, where they collect in groups. These are taken out to nuclei previously established outside, soon making strong colonies, not more than a dozen in number. The supers are clear and the honey all in with great speed without the use of brush or escape.

After extracting, the supers are stored in a large storage house near the main plant, since the crop is over and they will not be needed on the hives until the following season. The windows of the storage house are opened and the bees collected at the plant now busy themselves entering the great storage room, cleaning out the supers in short order, gradually leaving them nice and dry, ready for covering. No handling is needed. The colonies at the home plant store up quite a quantity of honey in this way and are in nice shape for winter. What of disease? There is no danger whatever, as

these colonies can be kept segregated and watched. They are not a menace to the honey-producing yards, which are all away from the home plant.

Thus by skill in management suited to his conditions, Eby has greatly reduced the cost of handling his honey. There is still another step needed which some inventive genius must supply; that is a machine or device which will make it possible to feed full extracting combs into a power uncapper which will deliver them to the extractor. This will save much labor and make it possible to handle a huge volume of honey in a short time.

stores of the same chain in the United States do not handle honey in most cases.

Action was taken in the business sessions of both associations requesting that the Census Bureau include bees owned in town for the next census report. Accurate estimates of the bee population and the production are of extreme importance in working up data in preparing for use in mapping out various procedures. Since most of the largest producers of honey, in the west at least, live in the cities their bees are not now included in the agricultural census reports.

The California State Beekeeper's Association gave a half day program outlined to picture their state, the honey plants and the beekeeping industry. The alfalfa, bean, black sage, buckwheat, purple sage, star thistle, orange and white sage honey areas were shown on the map. Most of these areas occupy a very small proportion of the state. The new apiary inspection system was explained. This is headed by a state man in Sacramento. Each county horticultural commissioner is ex-officio county bee inspector with power to appoint from an examined list of applicants one or more deputy inspectors to do the actual inspection work. A compulsory registration of all bees and locations is a part of the inspection detail. Free movement of clean bees is practiced.

First place among the state exhibits of honey was secured by California with Wisconsin second and Wyoming third. A long list of awards were made in many classes. Californians (native sons) probably never before saw such fine comb honey as was exhibited. Colorado, Wyoming and others of the intermountain states produce an unexcelled line. The white clover region was not well represented in the show, undoubtedly because of the handicap of distance. The judges for the honey show (selected by convention vote) were E. L. Shields (Canada), E. G. Newton and Prof. H. A. Scullen (Oregon).

Six men were present at this meeting of the League who were present at the last National Association meeting in Los Angeles twenty-five years earlier. These men are T. O. Andrews, L. L. Andrews, Roy K. Bishop, M. H. Mendleson, William J. Oates and George W. York. A photograph taken at the Los Angeles meeting was on display. Judging from appearances, some of these men must have been quite young at the time the photograph was made. It was of interest to note that many full beards and derby hats were in evidence.

C. L. Corkins was elected to the

(Continued on page 132)

Report of the San Francisco Bee Meetings

By Jake Haymaker

THE American Honey Producers' League met in joint session with the California State Beekeepers' Association at the Whitcomb Hotel on January 25-27. There was an important marketing conference held January 28. The keynote of the whole series of meetings was the marketing problem.

A very great interest was taken in the meetings generally. Hundreds of persons were attracted to the honey exhibit, which was stated to be one of the finest ever assembled. The writer certainly never saw an exhibit which would compare favorably with this one.

The human element ran strongly throughout the endeavors. Time and again it was suggested that the deliberations must include the viewpoint of the whole country. In the work of committee and individual, care was taken to prevent the actions from having a local or narrow bearing.

One of the moving spirits of the whole affair was Cary W. Hartman. His faithful work during the past months has done much to make the dreams for a great convention come true. The honey exposition was largely a result of his efforts. He was a logical man for selection to honorary life membership, and for this he was selected as a small token of gratitude.

Mr. A. W. B. Kjosness has a profound influence over the thoughts relative to marketing. His ideas, so modestly and quietly expressed, carried great weight. No one could fail to see the logic back of his plain statements based upon cold facts. Undoubtedly a great stimulus toward systematic, orderly marketing of honey has been effected.

A committee composed of producers, manufacturers, exporters and government men were asked to con-

sider and make recommendations on honey grades. After deliberation and discussion, a recommendation was made that the United States Bureau of Agricultural Economics secure, through the foreign offices, samples of honey for use in establishing standard grades for the world trade. A request was further made for the State Departments of Agriculture to assist in this work.

The Pfund grader came in for a little constructive criticism. It was suggested that a white glass background for the trough would be preferable. Also, the addition of daylight glass and some arrangement for uniform artificial light appeared to be highly desirable.

Five color grades were suggested for extracted honey. These are indicated on the Pfund grader as follows: Water white 0-7, white 9-26, light golden 28-39, light amber 41-75, and amber 77-114. It will be noticed that a tolerance is allowed between the different color shades. The term "light golden" is used now in Canada for her export trade. This is a better descriptive term for the honey than the term "extra light amber."

A committee on the standardization of trade terms recommended that export terms be sight draft or three days at the outside and also that an official referee be established in the principal European points.

The importance of merchandising honey was brought out time after time. It must go through the regular channels of trade in containers suitable in every way. The wholesaler and retailer are simply order takers who will supply whatever the public wants. The public wants are largely governed by advertising. Canada advertises honey by roadside signs and in other ways. Her chain stores handle much honey, while

Package Versus Overwintered Bees for Orchard Use as Pollenizers

By Ray Hutson, Assistant Entomologist, New Jersey Agricultural Experiment Station

FRUIT growers are generally awake to the advantage of having bees in orchards to increase the quantity and quality of fruit produced. This knowledge has created a growing demand for bees as pollenizers. It is probable that in regions where extensive orcharding is practiced the demand will soon exceed the profitably available supply. In anticipation of this condition some economical means of supplying bees must be found. As the first step a comparison of the strength of overwintered and package bees for spring use as pollenizers was undertaken at the New Jersey station in April, 1927. Previous observations having led to the conclusion that activity on blossoms and about the hive entrance are unreliable criteria, it was resolved to attack the problem of a significant comparison from another angle. The various considerations bearing upon the problem led to weighing the bees in overwintered hives.

The weighings were made after 3:30 p. m., April 17, 1927, when all but a very few stragglers were in the hive, on a No. 508 Fairbanks platform scale. On that date overwintered bees and package bees were being placed in orchards. The bees weighed were colonies selected at random from an apiary of about sixty hives, which to ordinary examination gave the impression of being stronger than most overwintered colonies. This apiary had been requeened the preceding August and the colonies had from ten to twenty-five pounds of unused stores present when the weighings were made.

Briefly, the procedure followed was to weigh the entire colony, remove the bees and then weigh the empty hive.

The details of removing the bees consisted of catching and caging the queen and shaking the bees into an empty box. After weighing the

empty hive and combs, it was replaced in its old position, the queen released and the bees dumped at the entrance. The weight of the colony minus the weight of the empty hive and combs equals the weight of bees per colony. These weights are shown in the accompanying table.

These figures give a basis of comparison between the strength of package bees and overwintered hives for orchard use. If the total number of bees in the ten hives is computed on the basis of 5,000 bees to a pound, which is generous, because at least part of the bees weighed had an opportunity to fill their honey sacs, it is found to be 108,750 bees. Ten three-pound packages (30 pounds) on the same basis contain 150,000 bees, an advantage of well over 40,000 bees in favor of ten one-pound packages when compared with ten overwintered hives. That this advantage is real as well as apparent is more patent when we consider that but one of the overwintered hives shows bees to the weight of three pounds, while only one hive, No. 5, shows a weight of bees of less than two pounds. Hive No. 5 reveals one of the chief disadvantages of overwintered bees in this comparison with packages. Overwintered hives are notoriously unequal in strength. Present day shipping methods have largely obviated the earlier criticism of packages on this score because of large losses in transit. Packages usually reach New Jersey with few dead bees.

It would appear from the above comparison that three-pound packages are superior to overwintered hives for orchard use in strength and uniformity. The greater population of three-pound packages, coupled with their uniformity, gives the orchardist greater opportunity to secure an equal distribution over the orchard, a situation constituting an

essential step in securing a good crop of quality fruit.

While the numerical superiority of packages is evident from these figures, it should be pointed out that there are other factors concerned. These things, amount of food present, combs, etc., make it imperative that attention must be centered on caring for packages as directed by the shipper or their additional strength will not be properly utilized.

(There is, however, a disadvantage in pound packages in the fact that, when received, they are without brood, while the home colonies have brood in all stages, if in normal condition. It takes twenty-one days for brood to begin hatching from pound packages.—Editor.)

Mountain States Honey

Utah apiarists held their annual two-day convention in the Hotel Utah in Salt Lake City, recently, with A. W. B. Kjosness, manager of the Mountain States Honey Producers' Association and former Idaho Agricultural Commissioner, as the speaker of the day. Bee men from all that section were there. Growth and achievements of the Mountain States Honey Producers' Association within the past few months to an organization controlling 57,000 colonies of bees, which will likely have a production of more than 5,700,000 pounds during the coming year, was reported in an address by A. W. B. Kjosness.

Mr. Kjosness said that the movement toward organization of the intermountain beekeepers began last February with a meeting at Laramie, Wyoming, with delegates from Colorado, Utah, Montana, Wyoming and Nevada present. The new association set 15,000 colonies as the minimum before business operations would begin. At the directors' meeting, in June, 22,000 colonies were reported signed and organization was completed with election of directors, as follows: A. W. Anderson, Utah; A. Sippel, Montana; C. H. Ranney, Wyoming; Frank Beach, Idaho; with J. M. Stark, of Idaho, president. Prospects for the future are particularly bright, with 57,000 colonies signed and requests from beekeepers of Washington and Oregon that they be taken into the association.

The association handled, in May, June and July of this year, thirty carloads of 1926 honey, advancing prices from 5½ cents per pound to

Pounds—Bees in Overwintered Hives

Hive No.	Pounds Bees
1	3
2	2
3	2.25
4	2.5
5	.5
6	2.25
7	2
8	2
9	2.75
10	2.5

Number of bees in 10 hives

21.75 lbs., equals 108,750

Number of bees in 10 three-pound packages

30.00 lbs., equals 150,000

7½ cents. Of the new crop of 1927, the association has marketed thirty-five carloads, all over the United States and in foreign countries. Eight carloads were shipped to London, two to Liverpool, two to Holland, two to Austria, and one to France, he reported. Mr. Kjosness also reported opening of a sales agency, and said the association has sales representatives in all the foremost countries of the world. Retail sales service will be opened in Los Angeles, San Francisco, Portland, Seattle, Spokane, Billings, and Casper. Prices of the new crop are 7 cents for amber and 8 cents for white. Advances are expected the first of the year.

A huge advertising campaign for the Utah product known as "Mountain Clover" honey will be staged, and the honey industry in the in-

termountain region next year will be worth more than \$1,000,000, or more than double its worth this year, he said.

Other speakers at the session included Dan Hillman, State Apiarist Inspector, who made a report on conditions in Utah, and several representatives, who also made reports. Members were urged to improve their shipping facilities, so as to get the honey to the market economically, by Carl J. Gordon, of the Continental Can Company of Chicago. Honey is now being used extensively for industrial purposes, F. L. Swanson, of Medina, Ohio, told members. "It is being used as a substitute for glycerin in making gaskets, face lotions and toilet soaps," he said. A radio broadcasting address was given over KSL by Mr. Kjosness.

G. L. Perrins.

Water-Formalin Solution

For Disinfecting Foulbrood Combs

By J. C. Elliott

The usual feeling of the apiarist who finds that he has hives infected with foulbrood is one of despair. He has heard of it, of course, but thought that it could never happen to him. If the inspector is present, he exerts a steady influence, but when you are all alone you are apt to think "shucks" or "heck," or maybe something even stronger. After the first panicky feeling has spent itself, if you are a fighter, you will say "Something must be done," and you will look around for a dependable remedy.

In my case the "Hutzelman" solution was priced, but as the cost seemed so prohibitive, the "water-formalin" solution was also priced. Actually the cost was about half that of the first named.

I knew enough of chemistry to know that the alcohol was only a carrier for the formalin, although it will dissolve some substances that water will not touch. I felt sure that the water-formalin solution would do the work, but I thought that one might have to soak the combs longer. I sent and got the water-formalin solution.

According to the directions, I needed to soak the combs twenty-four hours in clear water, then extract all the water out of them and soak in the solution for a similar period.

I was able to get an old gas tank at an automobile wrecking plant, that would hold ten combs, for one dollar. Two vessels were used, so one batch of combs could take the preliminary soak while another was getting the final soak. As soon as

the latter was done the frames would be ready to be put into the solution.

An extractor was used to get as much of the solution out of the combs that had been soaked as possible. This was put back with that in the tank. As there is some waste and evaporation, a little more of the solution had to be added after every forty or fifty combs to maintain the correct level in the tank. The extracting should be done only in a well ventilated room, as the fumes are very strong, but they are apparently harmless, although one's eyes water quite a bit.

All sealed cells were uncapped to permit the solution to penetrate more easily.

A hole, which was kept covered tightly, was dug in the ground, into which all of the water extracted from the combs after the first soaking, and before putting them into the solution, was poured.

All vessels were kept covered until the combs were treated. The bees will not bother the combs after they come from the solution.

The bees were shaken onto foundation and all of the combs except those containing a large amount of brood were treated; those containing much brood were stacked on one colony. Later, as I did not have a bee-tight place in which to work, and was too busy too, this colony was shaken at sundown and the combs burned that night. The charred remains were buried.

At that time (two years ago) one could get the material to treat three hundred combs for five dollars. The tank or tanks would be added to that

amount. The solution could be obtained more cheaply in larger quantities.

So much sticks to the combs, even after extracting, that by maintaining the proper level one may rest assured that the solution will always be of the proper strength.

The combs treated have been in use two seasons now and have not shown any reinfection or any new infection. The state inspector has pronounced them "clean" twice now since treatment.

Kansas.

New Recipe Book

The G. B. Lewis Company, in collaboration with the Kellogg Company, has just issued a new booklet of twenty-four pages with illustrations in color, entitled "Honey Recipes."

The recipes include breads, cakes and cookies, puddings, candies, sherberts and miscellaneous dishes. Every recipe is dependable, having been tested in the Kellogg laboratories. This is the best thing we have seen yet dealing with uses of honey in cooking, and it sells at a price which the beekeeper can afford to pay to put it in the hands of a select list of customers.

The idea of the booklet is to offer simple recipes making use of materials that the average housewife will already have at hand and which will encourage the more general use of honey. Single copies of the booklet sell for 15 cents per copy and may be had from the G. B. Lewis Company or from this office. It is a fine piece of printing and the colored pictures add much to its appeal.

For Bee Stings

By Dr. W. Ray Jones

I notice Cale's article in the January issue saying "guiacol" is good for bee sting. From his description, I recognize it as being our old remedy of guaiacol 20 per cent in glycerine or olive oil.

Guiacol is of the phenol group, chemically, and one of the major constituents of creosote. It is both antiseptic and a local anæsthetic without the destructive action of phenol. We have used it here in 20 per cent solution for mosquitoes, both to relieve the bites and to keep mosquitoes away.

It sounded so good for bee sting that I had to try it forthwith. I found it is about the best relief I know of that can be carried in the pocket for emergency use. It is of particular value to show your friends that you are trying to relieve their distress when they get a sting.

W. Ray Jones, M. D.

Extrafloral Nectaries, their Distribution, Role and Origin

By John H. Lovell

I. Historical

EXTRAFLORAL nectaries have received very little attention either from beekeepers or botanists. The manuals of botany devote a few lines or paragraphs to these glands, and occasionally a reference to the leaf-nectaries of cotton or vetch occur in the bee journals. When we examine the literature more in detail, we find that it contains comparatively few titles, many of the more important papers belonging to the last century, although a score on ant-plants have appeared since 1900. Among the first to observe extrafloral nectaries was B. M. Hall, a pupil of Linnaeus, in 1762 (*Nectaria florum*). Belt's description in "The Naturalist in Nicaragua," in 1874, of what was then believed to be the remarkable symbiosis between ants and the stipular thorns and nectaries of the bull's-horn acacia attracted wide attention. But the first careful investigation of these glands, their secretions, and uses was made by the Italian naturalist, Delpino, in 1874-76.

Two theories were advanced by the older flower-biologists as to the role of extrafloral nectaries. According to one view, sponsored by Kerner, they served to protect flowers from being pillaged of their nectar by ants and other small insects. The little marauders, it was believed, would be content with the sweet liquid found on the leaves and would not creep further up the stem. But, according to Delpino, extrafloral nectaries have been developed in all cases for the sake of attracting ants and wasps as defenders of the plants against their enemies, especially leaf-cutting ants. The two theories differ in that according to the first, all ants are injurious, while according to the second, certain species of warlike ants are a benefit to the plant. The evidence is wholly insufficient to establish either theory.

The Himalayan balsam (*Impatiens tricornis*) has been described as an example of a plant, the leaf glands



Fig. 2. Thorns of Mexican Acacia which are inhabited by ants (*Pseudomyra*). Notice the entrances near the ends of the thorns.

This is the first of two articles dealing with the source of nectar which is found elsewhere on the plant than in the flowers. It is a little known subject which should be of interest to every beekeeper.

of which protected the flowers. At the base of the leafstalk of many plants there are two small leaflike bodies or scales known as stipules. The stipules of the Himalayan balsam are modified into glands, one of which is enlarged and secretes a drop of nectar. The other gland remains small. Ants climbing the plant feed on these drops of nectar and are never found on the flowers. To this argument it may be replied that the nectar of the balsam flowers is secreted in a spur, where it is inaccessible

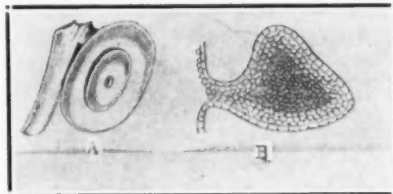


Fig. 1. A. Stipular gland of jewelweed with a drop of nectar on its center. B. Section of gland showing cellular structure. (Magnified.)

sible to ants, and it is due to this fact and not to the diversion of the leaf glands that the flowers are free from their visits. The common American balsam, also known as jewelweed (*Impatiens biflora*), bears glands on its stipules, which are practically functionless, yet I have never found ants in the flowers. The stems are very smooth and it is very doubtful if an ant could reach the pendulous flower. Even if it did so, it could not obtain the nectar, which is secreted in an incurved spur, where it is inaccessible. Fig. 1.

The presence of nectar glands on leaves leads to a much greater number of ants visiting plants, and to more flower rifling than occurs on plants from which they are absent. The purple clematis of the garden is seldom visited by ants. I placed on a number of leaves a small amount of sugar syrup. In a short time a great number of ants were running over the foliage, and the number continued to increase as long as I supplied the sugary liquid. To suppose that robbery can be checked by giving the robbers more spoil seems as illogical as to attempt to extinguish a fire by pouring oil upon it.

The theory of Delpino that the

role of extrafloral nectaries is to attract warlike ants, which serve as a bodyguard to protect the plants from destructive insects, especially leaf-cutting ants, formerly met with very general acceptance. The bull's horn acacia (*A. sphaerocephala*) of tropical America was thought to afford conclusive evidence in support of this view. In this and several other species of acacia there are a pair of hollow thorns at the base of each leafstalk, filled with a sweetish, spongy substance. Warlike ants puncture the thorns, take up their abode within, and feed on the sugary contents. Fig. 2. At the base of each pair of leaflets, on the midrib, is a crater-formed gland, which secretes nectar when the leaves are young. There are also little, nutritious, yellow food-bodies at the end of each of the many leaflets. While the assumption that the plant feeds and shelters the ants, and the ants defend the plant, seems at first probable, the evidence is not sufficient to sustain this hypothesis, for ant-abodes (domatia), extrafloral nectaries, and food-bodies are known to occur on plants not frequently visited by ants.

Delpino's theory has been demolished by many biological critics both in Europe and America. Plants not protected by a supposed bodyguard of warlike ants thrive quite as well as the ant-plants. Some of the ants living on plants, as *Asteca*, have no effective weapons with which to repel intruders. Leaf-cutting ants may be absent from regions where myrmecophytes (ant-plants) are abundant, as in Malaysia. Cotton is abundantly supplied with active leaf-nectaries, which secrete a large amount of nectar that attracts numerous ants; but it suffers notoriously from the attacks of caterpillars of moths belonging to the genera *Aletia* and *Heliothis*. Al-



Fig. 3. Extrafloral nectaries on the petiole and blade of a leaf of the passion flower (*Passiflora*).

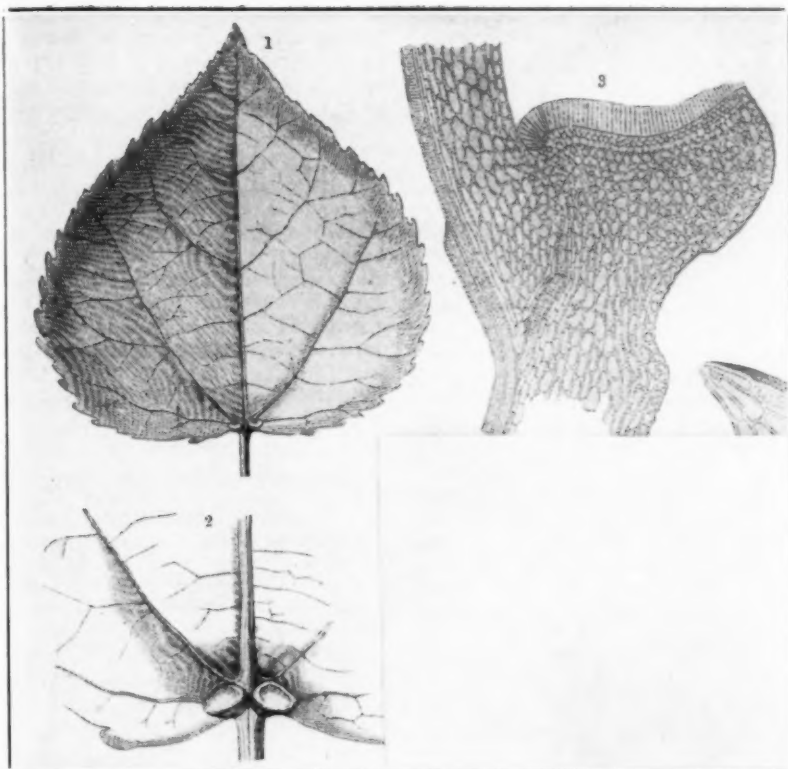


Fig. 4. 1. Leaf of poplar, natural size, with two little nectaries at base. 2. Cup-shaped nectaries much enlarged. 3. Lengthwise section of nectary showing small cells covered by a layer of palisade cells (long cells placed side by side like the stakes of a palisade).

though the castor-bean bears a great number of nectaries both on its leaves and stems, it is so smooth that it can be climbed only with great difficulty by ants. Why certain plants form abodes, saccate leaves, food-bodies, and extrafloral nectaries is not known. According to Bailey, the relation of ants to plants is purely a case of parasitism, in which all the advantage lies with the ants. And Richard Spruce long ago declared that ants are no more useful to plants than fleas are to animals.

Probably it would be an advantage to plants, on the whole, if they were never visited by ants; but it is certainly not true that ants are never any benefit to them. Undoubtedly ants prey on injurious insects, both in the adult and larval form, found on the foliage of plants. Several species devour the eggs, pupæ, and larvæ of the cotton caterpillar. I have seen ants capturing and carrying off bodily little dance-flies (*Empis*) from the catkins of the pussy-willow. In the province of Canton, China, according to McCook, the orange trees are subject to the attacks of a certain species of caterpillar. The orchardists colonize two species of ants on the trees, which capture and kill the destructive larvæ. To enable the ants to pass readily from tree to tree, all the trees in the orchard are connected by bamboo poles. Verily likely this

practice may now be discontinued; but the frequency with which ants destroy insects upon plant foliage might easily mislead to the inference that the role of extrafloral nectaries was to allure them. It should also be noticed that ants protect plant-lice, coccids, etc., which are injurious to plants, and that in many instances these insects are a greater attraction to ants than leaf-nectaries.

II. Extrafloral Nectaries.

Nectaries, according to their position on the plant, may be divided into three groups:

1. Intrafloral nectaries.
2. Circumfloral nectaries.
3. Extrafloral nectaries.

Intrafloral nectaries are found within the flower and act as an allurement to insects. Circumfloral nectaries are located on bracts surrounding the flower and in some instances aid in their pollination. Extrafloral nectaries are located on leaves and stems and, except in some insectivorous plants, have no useful function.

Common plants which have extrafloral nectaries are poplar, oak, peony, cotton, vetch, kidney-bean, broad bean, cassia, acacia, tree of Heaven, rose, thornbush, cherry, peach, syringa, passion flower (Fig. 3), vanilla jewelweed, laurel, cow-wheat, castor-bean, and the hau-tree. Poinsettia, snow-on-the-mountain, many other spurge, *Marcgravia* of Central America, cotton, the hau-tree, and a number of tropical orchids and compositæ have circumfloral nectaries. A larger number of species are enumerated by Delpino in *Bulletino Entomologico*, Anno VI, 1874. It will be noticed that these glands occur in widely separated families; on trees, shrubs, and herbs, on plants which have wind-pollinated flowers, as well as on those which have pollen flowers and nectariferous flowers.

Plants with extrafloral nectaries, according to the late W. E. Safford, are especially abundant in the Island of Guam. Among them are species of *Cassia*, *Erythrina*, and *Acacia* with stalked cup-like glands. They are also found on the stipules of *Jatropha multifida* and at the base of the leaf-blade of *Aleurites cordata*. Each nectary consists of a shallow saucer-shaped basin on a green stalk, lined with a layer of palisade cells, the nectar escaping through narrow slits or stomata. Some of the mallows in Guam, as *Urena sinuata*, have

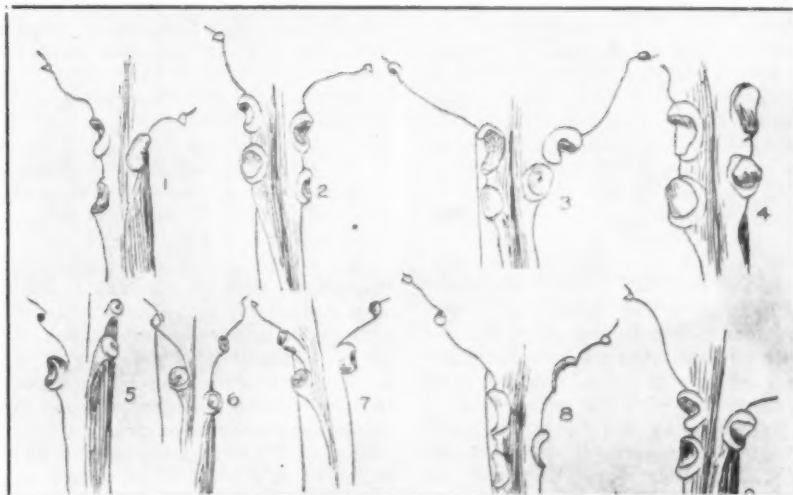


Fig. 5. 1, 2, 3, 4. Reniform glands of peach leaves. 6, 7, 8, 9. Globose glands of peach leaves.

nectar glands on the midrib of the leaves, and sometimes on the lateral ribs as well. They also occur on the midrib of the hau-tree leaf.

As the nectaries on the leaves and stems of many plants are essentially similar, it is not necessary to review every species on which they occur, even if space permitted; but it is desirable to briefly consider their occurrence and forms in certain widely separated plant groups in the hope that some light may be thrown on their origin. It is noteworthy that among ferns, which, of course, are flowerless, nectar is secreted by the genera *Pteris*, *Polypodium* and *Acrostichum*. Francis Darwin observed that the large glands at the base of the bracken fern (*Pteris*) while young secreted much sweetish fluid, which was sought by innumerable ants, belonging chiefly to the genus *Myrmica*. No plant is so little attacked by enemies as this fern, so that the ants could not possibly be of any use in protecting it from injury. The ferns are, moreover, many millions years older than the flowering plants, so that it is highly probable that there were nectar glands long before there were flowers.

None of the Coniferae, or cone trees, yield nectar, but honeydew is often gathered from the foliage, and several exude sap rich in sugar under certain conditions. (See the writer's article in American Bee Journal, March, 1921, page 93.)

Among the oldest representatives of the flowering plants are the deciduous-leaved trees, and one of the earliest members of this great series found in the fossil state is the poplar. On the base of each leaf of the poplars are two cup-shaped glands which secrete a sweetish substance. According to Kerner, they serve as absorbent cups, catching and holding minute drops of water, which is absorbed by the leaves. This view is highly improbable and may be rejected. The two cups, which are about the size of a grain of millet, are the two lowest teeth of the leaf modified. As nectar glands frequently occur on the margins of leaves, there can be no question that this is the case in the poplar. Fig. 4.

The flowers of the poplar are in nectarless catkins which are wind-pollinated. There is no reason to suppose that they were ever pollinated by insects. Now the poplar has been recorded from the Lower Cretaceous, and is the most ancient genus of Dicotyledons known. When this fact is taken in consideration in connection with the occurrence of nectaries among the ferns, it seems certain that extrafloral nectaries are much older than floral nectaries. In the South and West, *Populus monilifera* is subject to disastrous attacks of a chrysomelid beetle and moth,

the nectaries failing wholly to secure immunity for it.

Another wind-pollinated plant which bears a great number of extrafloral nectaries is the castor-bean, *Ricinus communis*. Nectar glands are common on the main stem at irregular intervals, on the leafstalks, and where the leafstalk joins the blade there are from three to five conspicuous glands. Furthermore, the entire margin of the leaf is fringed with glandular bodies. According to my observations, the glands secrete only a trace of nectar and are rarely visited by ants; but in a warmer climate they have been reported to yield more freely and to be frequently visited by ants and wasps. The stem of this plant is very smooth and shining and difficult to climb, while the flowers contain no nectar and depend wholly on the wind for pollination. The castor-bean is an imposing ornamental plant, and the foliage is very free from insect attack. External conditions offer no satisfactory explanation of so great a number of extrafloral nectaries. They are evidently spontaneous growths, the origin of which must be sought in the plant itself.

In the rose family extrafloral nectaries have been recorded on the plums, almonds, peaches, roses, and thornbushes. In the wild yellow plum (*Prunus americana*) glands are usually absent from the leafstalks; in the Canada plum (*P. nigra*) there are one or two red glands near the base of the leaf; and in the wild goose plum (*P. hortulana*) there are two glands near the base of the leaf and the teeth of the leaves are glandular.

Around the leaf-glands of the peach there has grown up a small literature, as the sections into which the peaches are divided are based on the forms of these glands. Three groups are recognized: (1) trees which have no glands on the leaves; (2) the glands are reniform, or kidney-shaped; (3) the glands are globose. The reniform glands are the most abundant, occurring on the leafstalks and on the leaf-margins replacing the teeth. The globose glands are raised on short stalks and are distributed in the same way as the reniform glands. Fig. 5.

When the leaves are very young the glands secrete a sweet liquid in abundance. A bitter substance also exudes from the spines on the tips of the leaf-teeth, which has a very unpleasant taste resembling that of the sap or of the fruitstone. The bitter substance is evidently an exudation of the sap known as guttation, which usually consists of nearly pure water, but which varies greatly in its composition in different plants. Ants feed on the nectar, but are of

no known benefit to the trees. Leaves having glands have been stated to be free from powdery mildew; but on the other hand peach-leaf curl has been said to attack most severely gland-bearing leaves.

There is also wide variation in the distribution of the glands. The entire foliage of a tree, or a portion of it, may be glandless. Trees may bear only reniform glands, or only globose glands, or both kinds. But most trees have only one kind of gland. The globose glands appear to be modified leaf-teeth, and to pass over into reniform glands, a transformation which will be considered later.

Report of San Francisco Bee Meetings

(Continued from page 127)

presidency and will no doubt ably carry the responsibilities of the office.

The new officers of the California State Beekeepers' Association (which is affiliated with the American Honey Producers' League) are William J. Oates, Lompoc, president; A. M. Hengy, Oroville, vice-president, and Cary W. Hartman, Oakland, secretary-treasurer. This association has been largely concerned during recent years with legislative matter. Satisfactory law adjustments have now been made and attention is being turned to the marketing problems generally.

A most instructive paper on marketing of honey was prepared at Cornell University. A request for a general survey of the honey markets was made a year or so ago by the League and this paper was the result. The United States Department of Agriculture and the Bureau of Economics cooperated in assisting with this work. The paper is to be given wide publicity by reprint in the press. The fact that the chain stores did not handle honey in appreciable amounts was brought out clearly. Reasons for the slow movement of this product were pictured. The principal reason appears to be a lack of advertising.

Buckwheat Honey

The color of buckwheat honey varies from light amber to very dark, almost black; its flavor from very mild to extremely pungent. All depends on locality of origin, whether produced from plants grown on light sand or heavier soils.

Hence lovers of buckwheat honey should seek to establish communication and buy from nearby producers who live on soil that gives such honey the preferences desired.

I. G. Noramus.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

FEEDING HONEY TO BEES

I have several hundred pounds of very dark honey I wish to feed my bees in spring. There are no other bees nearer than one mile. I understand some beekeepers practice open air feeding. I would like your opinion of it; is it practical, also the method used? UTAH.

Answer.—We do not recommend open air feeding, for several reasons. First, when you feed in the open, the strongest colonies get by far the most honey and some colonies may store a surplus, while some weaker colonies, that need it more especially, do not get a fair share. Secondly, there is always a possibility that other bees, even a mile away, will get a share, as they are attracted by the noise the bees make in gathering the honey. Another reason is that it teaches them to look for something to pilfer, for many days, after the feeding.

However, if you wish to try it, we recommend that you put enough out to keep all the bees busy. This will prevent their fighting from one hive to another. Then be sure and put many floats on the tubs or receptacles containing the honey, so that the bees will not drown in it, for they are so eager that they rush on it and drown in it.

Some beekeepers feed in tubs, in the open air, very thin feed, containing about two pounds of sugar to the pound of water. You might try this with honey, using about three pounds of honey to the gallon. But you must use the same precautions as if you fed them the pure honey.

OUTDOOR FEEDING

1. Is there a practical method of open air feeding to stimulate brood rearing? Our bees are well packed in one-story, ten-frame hives, with plenty of good stores. Will unpack May 1 and add second story with drawn comb. A small amount of pollen and honey starts in April, but the main honey-flow (alfalfa) not before June 20. What ratio of sugar and water? How long should they be fed, as well as the amount per day per colony? At least 80 per cent are queens less than a year old.

2. Will two-pound packages with young queen build to good strength in sixty days? IDAHO.

Answer.—1. I have never practiced outdoor feeding, but I know of some beekeepers who succeed very well, by feeding a very light syrup, not over two pounds of sugar per gallon. They put it in tubs where the bees can get at it readily. There is less excitement with this light food than there would be with rich food, and less danger of attracting the bees of other apiaries, which is the most objectionable feature of outdoor feeding. As to the quantity to feed, it must depend upon the season, the number of bees in the hives and the question of whether there is other food to be found. Keeping an eye upon the colonies and examining them regularly is the only way to decide on the quantity. Put floats on the water in the tubs.

2. Two-pound packages will gain strength promptly if they are well supplied with food, but that also depends more or less upon the weather, as cool or cold weather will delay the laying of the queens and the development of brood. None of those things

can be decided with arithmetical accuracy. Feed regularly, watch your colonies, keep the hives well protected in cool weather and you will get results.

HATCHING CHICKENS IN HIVE

Some time ago I read in some bee journal about hatching chickens on the top of a hive of bees, and as I have a few swarms at home I would like to try this out, if you could give me any information on the subject. WISCONSIN.

Answer.—I have also heard of hatching chickens on a hive of bees, but I believe this is more fancy than facts. It seems to me that it would disturb the bees greatly when the chickens began to hatch and might cause them to dwindle. However, it is probable that the warmth of a colony would be sufficient if the chickens were hatched right over the brood combs of a strong colony, with a thick cloth between the eggs and the bees.

TRANSFERRING

I have some colonies of bees in old gums and want to transfer them to movable-frame hives. When is the best time of year to do so? I thought I could put the old gum on a bee escape board on top of the new hive body and they would go through. Will the queen go through the bee escape? VIRGINIA.

Answer.—The method that you propose to follow is not very practical. However, if you drove a number of bees out with the queen and gave the new hive some comb foundation, they might transfer themselves slowly. It would be all right to keep the queen above with a queen excluder and she would have to stay above. But it would weaken the colony, as they could not take as good care of their brood when so divided.

We usually transfer bees at the time of fruit bloom, and transfer all the combs having brood into the frames of the new hive. We have published a small pamphlet on transferring which explains how we do it. But it is quite a little work. If you wish to use the method you propose, you had best wait till the weather is fairly warm, not before fruit bloom at any rate.

MICE IN HIVE

I have had two colonies of bees destroyed by field mice and have decided to use hardware cloth over the entrances of my M. D. hives in the future. What mesh would prevent the entrance of mice and yet offer no obstacle to the bees, two, three or four meshes to the inch? Also, when packing bees for outside wintering, is it advisable to press the insulating material (hay in my case) tightly between hive body and outside case, or just pack it in moderately?

In the December number of the American Bee Journal, on page 634, "North Dakota" asks, "What is 'High Life'?" It is the term used in the Northwest and Southwest for carbon bisulphide. Years ago I lived in Sturgis, S. D., and at that time it was used a great deal by ranchers, but for what purpose I do not know. NEW YORK.

Answer.—Three meshes to the inch would make an opening just a little smaller than the usual spacing for passage of bees. Of course, bees may go through a much smaller space, since it is figured that 16-100 of an inch will permit workers to pass and exclude queens. The space commonly figured.

(Continued on page 135)



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JES DALTON'S

"Pride of the Reconstruction Stock"
For Spring of '28

The first line in every Louisiana beekeeper's ad should be one of thanks to our friends whose generosity in time of disaster enables us to be able to appear again. (This is mine.)

I lost all my bees and household goods in the flood, but old customers shipped me back tried-out stock from the North, and beekeepers from all over the U. S. donated choice breeding stock to the reconstruction work.

Using the old and picking and selecting from the donated, and breeding along Mendel's lines under Quinn's instructions, and testing them for effective tongue reach with his machine, I have stock that it is with pride I can now offer you.

Good, young Italian queen, on two Hoffman frames of brood and honey, with two pounds extra shaken in, introduced and laying before she comes to you, per package, \$6.00 f. o. b.

POSITIVELY MAY DELIVERY

They reconstructed Louisiana beekeeping. Let them reconstruct yours.

JES DALTON

(On high hills at)

ST. FRANCISVILLE, LA.

Kellogg has mentioned honey over five million times. How many times have you mentioned Kellogg's pure foods?

Bees and Queens for 1928

ITALIANS, CAUCASIANS

We are now booking orders for bees and queens for delivery any time after March 25. No down payment required, but must have remittance before shipment is made.

Safe arrival and satisfaction guaranteed.

Two-pound packages with queens:
1 to 24, \$3.50; 25 to 49, \$3.25; 50 to 100, \$3.00.

Three-pound packages with queens:
1 to 24, \$4.00; 25 to 49, \$3.75; 50 to 100, \$3.50.

Purely mated queens: 1 to 24, \$1.00; 25 to 49, 85 cents; 50 to 100, 75 cents.

A 12% discount on all orders received during January and February if full amount is sent with order at time of booking.

Write for our free catalog of BEES and BEE SUPPLIES.

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You Can Depend on York's Bees for Honey

Package bees, nuclei and queens. Our bees and customers are our best advertisers. Booked to capacity for April; 95 per cent of orders are from old customers. Can supply several hundred packages and nuclei for May delivery.

Queens will be better than ever before, three-band, leather color Italians of the highest quality and bred for business.

Live and let live prices, satisfaction and a square deal guaranteed.

The place where you get full value for your money.

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Our yards are absolutely free from disease, and a health certificate will accompany each shipment.

All bees will be accompanied by a young Italian queen introduced before shipping, so there will be no loss of queens. All dead bees will be promptly replaced if proper notation is furnished by express agent. Shipping date starts April 10, 1928.

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Three-frame nuclei with queen, single lots	\$5.00 each
Three-frame nuclei with queen, 10 lots	4.50 each
Three-frame nuclei with queen, 25 lots	4.25 each
Three-frame nuclei with queen, 50 lots or more	4.00 each

G. A. Carpenter, Danville, Ky., says: "Nuclei received April 17, ready for supers before June. Stored more than 100 lbs. of honey by July 10. Want more next year."

The Dr. Shaw Apiaries

228 East Oglethorpe Ave. Savannah, Georgia

(Continued from page 133)

to enable worker bees to travel back and forth, varies from 16 to 22-100 of an inch. I do not believe that any mouse small enough to go through a space as small as three to the inch can do any damage worth mentioning. This would probably be objectionable to the bees when they wish to cleanse their home and remove dead bees, so I would recommend that you use it only during cold weather and remove it for warm days.

PACKAGE BEES

1. When receiving package bees, how many frames of foundation should be given to them on the start, say two-pound package.
2. Should I use frame follower?
3. When is best time to get bees, April or May?
4. Should they be fed for a while?

KENTUCKY.

Answers.—1. I would not give less than six frames of foundation to a two-pound package, when hiving them.

2. A frame follower or division board is not indispensable, but would be better, if you do not fill the hive full of foundation or combs.

3. The best time to get the bees is just before fruit bloom begins with you. You know the date better than I can tell from here. But be sure and send your order ahead of time, so the breeder will have time to supply you.

4. The bees should be fed liberally as long as there is not honey in the field. Otherwise, they might not breed as much as they ought to.

BEE PASTURE

We have sweet clover, white clover, horsemint, and of other bloom. I suppose, about an average. What is bothering me is: How many colonies can I keep at one place? Is it necessary to sow seed for their support, and what kind and how much? I have carefully looked over my Journals, but don't see a word about that. I suppose beekeepers know all about that, but I do not. Any advice you can give me will be appreciated.

ARKANSAS.

Answer.—It is very difficult to say how many colonies may be kept in one spot if there is plenty of both sweet and white clover, horsemints and other plants for honey. Much depends upon the number of acres in the clovers. If there are large pastures in your vicinity and they are well supplied with white clover, you may harvest a large crop per colony, even if you have as many as a hundred colonies in one spot. Sweet clover, if scattered through waste land, is also very good.

I would judge that such a spot as you describe would be good for eighty to one hundred colonies. Of course, seasons differ and the crop is not always good.

There is no need of adding to the flora, unless you wish to sow buckwheat for fall. Many people do that, especially in the eastern states. We do not find it advisable, for buckwheat is inferior honey.

Of course, the amount of land occupied with the clovers will have a great deal to do with the crop. But I figure on the average that may be occupied with them in an average vicinity.

CLOUDY HONEY

My 1927 honey crop has been much lighter in color than other years, but it is cloudy, and not clear like in past. What is the cause?

NEW JERSEY.

Answer.—I believe the reason why your honey is not clear as it was last year is that it is preparing to granulate. If you heat it a little, it will get clear again. But it is all right when granulated.

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Three-pound package on standard Hoffman frame of brood and honey, with select Italian queen, \$4.75 each; ten packages, \$45.00. Queens introduced if wanted. Combless packages same price.

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Twenty per cent down, balance shipping time. Season opens April 20.

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MONEY saved by ordering Lewis and Dadant goods at factory prices from Winona, Graceville, or Brainerd, Minnesota.

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Select Untested	2 25	9 50	18 00	1 75	9 00	15 00	1 50	7 50	13 50
Tested	3 00	16 50	30 00	2 50	12 00	22 00	2 00	10 50	18 50
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FEEDING HONEY

1. I have some dark strained honey, which I would like to feed back to the bees. I generally use eight parts water to one part honey, for spring feeding. Would it be safe to feed the bees, after this was well boiled together, so there would be no chance to feed them foulbrood? It is plentiful here.

2. How long can a queen be kept in a cage in a hive without doing her any harm?

NEBRASKA.

Answer.—1. Yes, the honey will be all right to feed the bees at a time when they can fly every three or four days. But you must be sure to boil it enough to destroy all germs of foulbrood, for honey is the best source of infection when it contains germs of bacillus, even though these are entirely harmless to human beings.

2. A queen can live in a cage several weeks, and occasionally several months, according to the care she receives from the bees, but we cannot say that it is as good for her as to be free on the combs. If one had to keep queens a long time caged, it would be worth while to make small nuclei with four or five square inches of comb and a retinue of forty or fifty workers. Such a box could be kept in the hive within the warmth of the cluster.

QUEEN TRAPS

I have a few swarms of bees and have no way of looking after them when they swarm, as I go away to work in the morning and am away all day. I lost most of my young swarms last summer. Is there any way that I can use a queen trap to save the swarms?

MASSACHUSETTS.

Answer.—Yes, you can prevent your bees from swarming by using an entrance guard or a queen trap. The queen trap has to be examined every evening at swarming time, as the queen goes into it and may remain there. The entrance guard simply prevents her and the drones from flying out.

However, an entrance guard or a queen trap is in the way of the bees and induces them to swarm, as they find it inconvenient and cannot ventilate the hives so well with it on. We prefer not to use the implements and prevent our bees from swarming to any extent, by giving them plenty of super room, plenty of shade, plenty of ventilation, and keeping out the drone comb and furnishing the hives young queens every year or at least every two years.

You probably use small hives, eight-frame Langstroth hives. This, of course, is an inducement to swarming. You should read our book, "The Dadant System of Bee-keeping."

USING OLD FRAMES

When I purchased this place there was about a thousand good frames in the cellar and all cleaned. The former owner informed me they were frames he melted down that had foulbrood. I took about two hundred of them and boiled them in strong disinfectant and was going to use them, but a friend advised me not to. I have no disease in my apiary of 200 colonies and would not like to take any chances of getting any for twice the price of the frames. But if there is any safe way of using those frames, I would use them. They are all metal-spaced frames and it seems too bad to have to destroy them.

ONTARIO.

Answer.—The authorities who discovered the germs of the disease tell us that boiling a half hour in water destroys these germs. So it should be safe to use those frames after boiling them in this way. But, on the other hand, some of the authorities in the West advise to burn up everything that has had the disease, and it may not be advisable for you to take any risks. If you boil those frames, do it very thoroughly and carefully.

A Few Notes from Missouri

The annual meeting of the Missouri Association, held at Columbia, January 19, was extremely well attended, and with an interesting program.

While the new Missouri law is not perfect, it is surely a big advancing step in Missouri beekeeping, and is already producing praiseworthy results.

We need a permanent apiary building for the State Fair at Sedalia. If the beekeepers of Missouri cooperate as well with that as they did with the securing of the law, there is no doubt in my mind but that we can secure what we want from the Legislature.

In the last three years the membership of the association has increased 400 per cent. All of us co-operating, we should be able to organize more county associations, get a new apiary building, more money for premiums, more rigid enforcement of the disease law, and a creditable display in the State Museum at the State Capitol.

Clay T. Davis, Sec'y.

A Freak Year in Indiana

Last season was a freak in many ways. Up until July, we had to feed in our section, on account of wet weather. No swarms until that time, and I had begun to think, no swarming at all.

In July the rains let up, bees got busy, and the wet season had brought on a 100 per cent crop of heartsease. Thousands of acres on hill and in valley were pink with bloom. Corn had drowned out, and heartsease had taken the fields.

Bees began to store surplus and swarm. Ordinarily we look on an August swarm as a calamity. But these new swarms, many of them, as late as August, not only filled their hives from foundation, but stored as much as 125 pounds surplus.

I will sell all of my crop easily, thanks to having kept my trade supplied with honey which I brought in, during the lean years.

John H. Chappell.

A Clever Advertisement

We are indebted to A. W. Puett, of Robert Lee, Texas, for a very clever piece of advertising matter put out by the Southwestern Engraving Company. They use the partnership of the honey-bird and the honey-badger of Africa as a basis for their advertising. It is said the honey-bird finds the bee trees and attracts the animal to the vicinity. The honey-badger is able to dislodge the bees and expose the sweets, of which he is very fond. The bird gets the brood for his share of the booty.



Display your Honey Perfectly

Dependable Service

On Standard Sizes

Distributed by

Dadant & Sons, Hamilton, Illinois

and

G. B. Lewis Co., Watertown, Wis.

G. B. LEWIS CO.,

1921 E. Fourth St., Sioux City, Iowa

G. B. LEWIS CO.,

10 Tivoli St., Albany, N. Y.

G. B. LEWIS CO.,

1304 Main St., Lynchburg, Va.

G. B. LEWIS CO.,

318 E. Broad St., Texarkana, Ark.

Hart Glass Mfg. Company

Dunkirk, Indiana

PACKAGE BEES THREE-BANDED ITALIANS, ONLY

WE GUARANTEE shipment on scheduled date—overweight when shipped—no disease—health certificate—vigorous young queens, purely mated. And in addition, guarantee you 100 per cent satisfaction in every respect, which includes safe delivery.

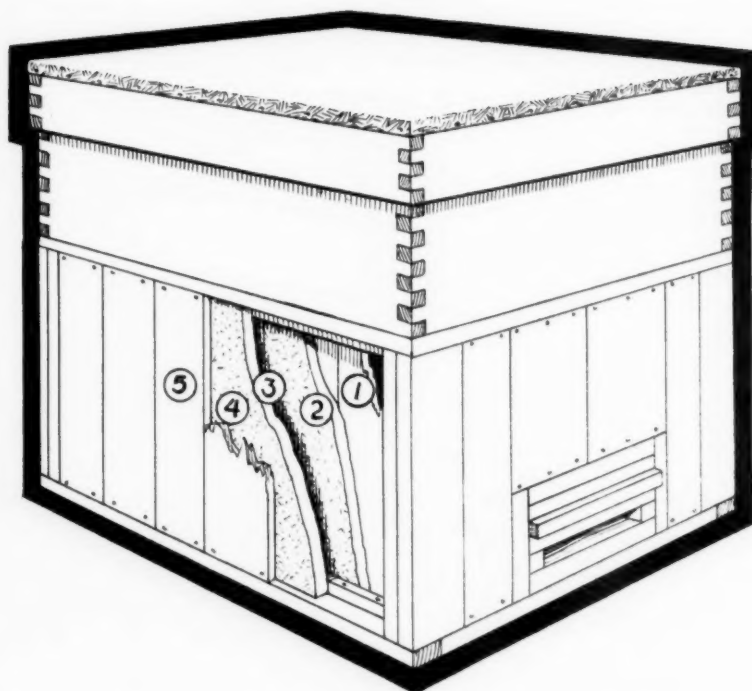
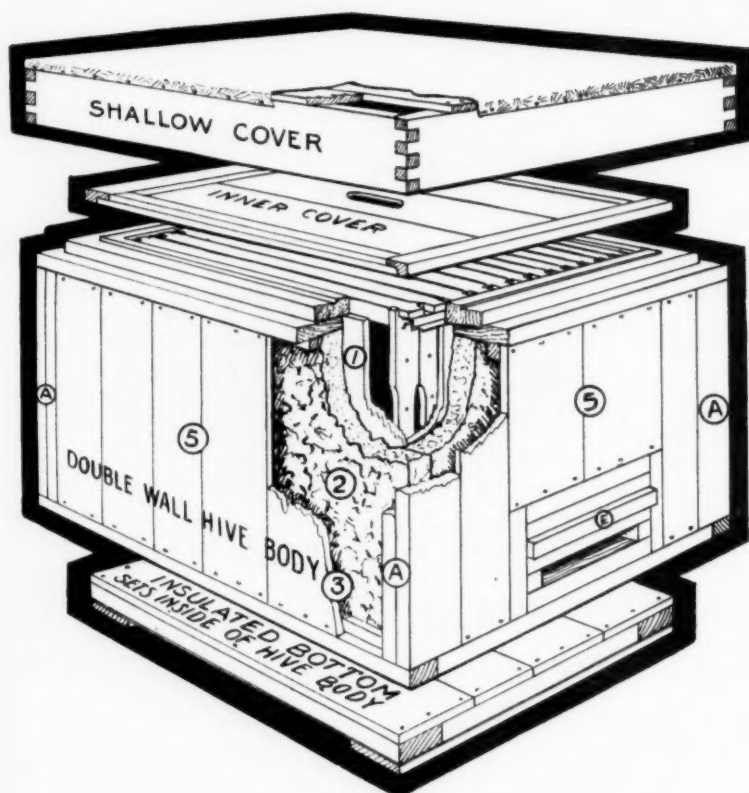
2-lb. package with young queen.....\$4.00
3-lb. package with young queen.....5.00

Discounts on quantity orders

Correspondence and inquiry solicited

URIAH APIARIES, Box (A), Uriah, Ala., U. S. A.

Woodman's Protection Hive



Specifications

- 1 Inner wood hive wall.
- 2 Celotex insulator.
- 3 Dead air space and liner strips.
- 4 Celotex insulator.
- 5 Outer wood hive wall.

Total thickness of hive wall $2\frac{3}{8}$

Galvanized metal roof cover

Winter rim for overhead packing

Insulated, adjustable, removable bottom board

Adjustable entrance

Takes standard 10-frame supers or bodies

Hive body holds 11 frames with $1\frac{3}{8}$ spacing, 10 frames with $1\frac{1}{2}$ -inch spacing, $9\frac{1}{4}$ or $11\frac{1}{4}$ inches deep

Any desirable insulating material can be used, such as Celotex, Corkboard, insulating paper or other materials.

Descriptive matter and large illustrations will be mailed on request.

A. G. Woodman Co., Grand Rapids, Mich.

Jarvis to Ruddy Company



G. L. Jarvis, who has resigned from the Apiculture Department at Guelph to accept a position with Ruddy Mfg. Co.

G. L. Jarvis, of the Department of Apiculture at Guelph, with Professor Millen, has resigned to accept a position with the Ruddy Manufacturing Company, Ltd., of Brantford, Ontario, under Mr. Craig, who is in charge of the bee supply department.

Through his work in inspection and grading, Mr. Jarvis has been of much service to the beekeepers in Ontario and has many well wishers and friends, who wish him success in his new place.

Mr. Jarvis was born near Port Stanley and has been interested in bees nearly all his life. He graduated from Guelph in 1910. He started the quarantine method of disease eradication in the Province, which has proved to be successful.

Mrs. Paddock Taken by Death

As we go to press, we learn of the death of Mrs. F. B. Paddock, wife of the State Apiarist of Iowa, at Ames.

Mrs. Paddock has been in ill-health for several months, and for weeks her condition has been serious.

Interment was made at Longmont, Colorado, her old home.

The sympathy of our staff, as well as of the beekeeping fraternity, goes to Mr. Paddock and his little daughter, Mary Elizabeth, in their loss.

Government Poster

"It's All Good Honey"

We are glad to be able to reproduce in a very small way, and in one color only, the beautiful new poster gotten out by the United States Department of Agriculture, "It's All Good Honey."

Every beekeeper should send to the United States Department of

Agriculture, Washington, D. C., for one of these posters. The price has not been determined, but will be announced in our next issue. This is one of the most valuable posters ever gotten out for the beekeeper. It gives a full and concise description of honey, and if placed in a prominent position will attract attention and give much information to the public.

In order to find out whether it would be possible to place this poster in the local postoffices all over the country, our office took the matter up with the postmaster at Hamilton, Illinois, and the reply from the postmaster general at Washington was in part as follows:

"Referring to your letter of the 21st instant, inclosing one from Mr. L. C. Dadant of Hamilton, Ill., requesting permission to display in the lobby of your postoffice a poster issued by the Department of Agriculture, captioned 'It's All Good Honey,' you are informed that the Department will interpose no objection to the display of this poster, either framed or unframed, with the understanding that the poster will not bear any advertisement of a private matter. See Section 319, Postal Laws and Regulations."

Respectfully yours,
Chas. F. Trotter,
Acting First Assistant.

It will be seen, therefore, that with the permission of your postmaster, it will be perfectly possible for any beekeeper to display this wonderful poster in the postoffice lobby. We strongly urge every beekeeper who is interested in seeing the sale of honey promoted to get one of these posters and give it prominent display.



BRIGHT ITALIAN BEES and QUEENS

I do everything possible to have my packages give satisfaction. Every package has one of my carefully raised young queens. I supervise all shipments.

I've never had a dissatisfied customer, but satisfied ones from 32 states have praised gentleness, prolificness, honey production, and promptness in filling orders. Write for prices. They're reasonable.

M. STEVENSON, Westwego, La.

BEE PARADISE

Minnesota and North Dakota lead in the production of sweet clover seed. Acreage increasing rapidly. In six counties in northeastern North Dakota there are about 122,000 acres of sweet clover. Climatic conditions are extremely favorable for bees; warm summer days and cool nights. Write for FREE BOOK on agricultural resources of Minnesota and North Dakota. LOW ROUND TRIP EXCURSION RATES.

E. C. LEEDY

Great Northern Railway, Dept. J-2
St. Paul, Minn.

Running's Bees and Queens

ITALIANS THAT ARE
HONEY-GETTERS

We are now booking orders for 1928 delivery. Shipping begins April 1. We have been producing package bees in the South for eight years and have one of the best package and queen-rearing establishments in the South, and have been producing large crops of honey in Michigan for 28 years.

WE HAVE THE STOCK AND
KNOW THE BUSINESS

Try one or a hundred and you will want more. They get the honey. We want to show you. Bees and Queens shipped from Epes and Sumterville, Ala. Our prices are right, stock unexcelled and service guaranteed. Write for prices, stating how many you can use.

David Running,

Filion, Mich.

After Jan. 15, Sumterville, Ala.



CAUCASIANS CARNIOLANS PACKAGE BEES

Beekeepers: Do you want thriftier, more hardy bees? Do you want bees that winter better, that are gentler and give larger average yields of honey per colony? If you do, then try our line of gray bees and queens.

Untested queens, \$1.25 each; six, \$7.00; twelve or more, \$1.00 each.

Two-pound packages with queens, one to five, \$4.00; five to nineteen, \$3.50; twenty or more, \$3.25 each. No disease and delivery guaranteed.

Write for circular which gives full particulars of our bees and queens.

W. A. HOLMBERG, Turlock, Calif.

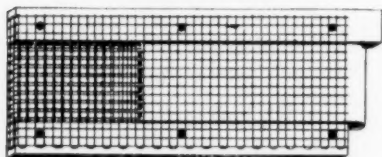
HIGH GRADE ITALIAN QUEENS

Write for our free booklet
"About Bees"

JAY SMITH

Route 3 Vincennes, Indiana

INTRODUCING CAGE



15c each. 12 \$1.00

Diemer's Three Banded Bright Italian Queens

Before June 15, Select Untested, any number, \$1.20 each. Tested, \$2.00

After June 15, Select Untested:

- 4 or less, \$1.00 each
- 5 to 10, 90c each
- 11 to 20, 85c each
- 21 to 50, 80c each
- 51 to 100 or more, 75c each

Queens sent in introducing cages. Write for circular giving principle of queen introduction and prices of package bees. Prompt service and a square deal.

J. F. DIEMER, Liberty, Mo.

RED STICK

PURE ITALIAN

QUEENS—PACKAGES—NUCLEI

Decide on RED STICKS for the coming season and rest assured that you have invested wisely.

Prices April 1 to June 1:

Select Untested Queens
1 to 4 5 to 9 10 to 24 25 to 100
\$1.00 \$.95 \$.90 \$.85

Two-pound Packages
1 2 to 9 10 to 24 25 to 100
\$3.60 \$3.50 \$3.35 \$3.20

Three-pound Packages
\$4.35 \$4.25 \$4.10 \$3.95

Two-frame Nuclei
\$3.85 \$3.75 \$3.60 \$3.45

Three-frame Nuclei
\$4.75 \$4.65 \$4.50 \$4.35

Service and satisfaction guaranteed. Health certificate furnished. Pure matings and safe delivery guaranteed. Write for circular and further information. We are not in the flood area.

RED STICK APIARIES, Baton Rouge, La.

Golden Northern Bred Queens

Write for Prices for Spring Delivery
HERMAN AHLERS, Astoria, Oregon

Meetings and Events

Southern States Conference

A meeting of the southwestern states comprising Texas, Oklahoma, Missouri, Arkansas and Louisiana was held at Texarkana on January 20 and 21.

Representatives from four of the five states were present and a lively meeting was held.

Resolutions protesting against the use of corn sugar in food without so stating on label were passed and sent to legislators at Washington, D. C.

Recommendations to the Department of Agriculture at Washington were also sent recommending the establishment of a field station for beekeeping somewhere in the South.

Because of the problems which are peculiar to the southern states, a station of this kind is a necessity, for it is from the southern states that practically all of our package bees and queens come.

An organization called the "Southern Beekeeping States Federation" was organized with the following officers:

Lee Cazort, president, Lamar, Ark.; J. V. Ormond, secretary, room 336, State House, Little Rock, Ark. Executive Committee: E. G. LeSturgeon, chairman, San Antonio, Texas; J. C. Dods, 3514 Windsor, Kansas City, Mo.; Jes Dalton, St. Francisville, La.; Eugene Holloway, Marietta, Okla.; R. E. Foster, Gainesville, Fla.; J. V. Ormond, Little Rock, Ark.

It is planned to hold an annual "get together" meeting of most of the southern states each year to discuss problems and compare experiences. The sense of the whole meeting was for hearty cooperation, not only among the southern states, but with the northern states as well, relative to all subjects pertaining to beekeeping.

Arkansas State Meeting

An enthusiastic gathering of beekeepers of Arkansas met at the State House on January 18 and 19 with Lee Cazort, of Lamar, presiding. Among the speakers were Governor John E. Martineau, E. L. Sechrist, and James I. Hambleton of the Department of Agriculture, Washington, D. C.; W. L. Flannery, M. & N. A. Railroad; Mrs. Cornforth of the Kellogg Manufacturing Company; E. G. LeSturgeon, of the Beekeepers' Item; Fred W. Muth; Craig Rosborough of the Cotton Belt Route; Kenneth Hawkins of the G. B. Lewis Company, and L. C. Dadant of the American Bee Journal.

Much very good work is being done in Arkansas by Chief Inspector of Apiaries J. V. Ormond, and the state organization is now in very good shape.

Resolutions condemning the corn sugar legislation proposed at Washington, D. C., were wired to the secretary of agriculture and to the Arkansas legislators.

In many of the talks given to the assembly it was recommended that beekeepers of Arkansas investigate the possibility of shipping package bees. Arkansas' location is particularly fitted for production and shipping of bees because not only of having a constant honeyflow but also because of its nearness to the northern market.

Craig Rosborough, in his report, showed that the maximum production for any county in Arkansas was 33,000 pounds, and indicated the opportunity for greatly increasing this yield.

Arkansas is due for a very rapid progress in beekeeping and will be heard from later.

Mountain States Bee Men Meet

J. M. Stark, of Middleton, was re-elected president of the Mountain States Honey Producers' Association at the directors' meeting of the organization at Boise, Idaho, early in February. The association, which came into existence last May, represents 60,000 bee colonies in eight states, three states having come in at the first annual meeting which convened here. Washington, North Dakota and Colorado honey producers have joined forces with those of Idaho, Utah, Wyoming, Montana and Oregon.

The directors chosen in addition to Mr. Stark are: C. H. Ranney, of Lander, Wyoming, first vice-president; R. G. Rhees, Ogden; O. A. Sippel, Bozeman, Montana, all of whom make the executive committee. Others are Charles Brittain of Seattle and Ralph G. Smith of Amenia, North Dakota.

The price for white honey in foreign markets was set at \$11.50 for fifty kilos in Hamburg. Light amber honey was set at \$11 per fifty kilos. This is \$10.45 per hundred for white honey and \$10 per hundred for light amber. The selling price of 7 cents per pound for extra light honey and 8 cents for white, f. o. b. shipping point, was to be maintained, the directors decided.

Figures of the association showed that but 100 cars of honey remain unsold at this time, whereas last year there were 220 cars unsold.

Glen Perrins.

Colorado Honey Exhibit

Announcement of the annual exhibit of goods made with honey, to be held in Denver, March 5 and 6, under the auspices of the Colorado

Honey Producers' Association, has been made.

The membership of the association includes residents of Colorado, Wyoming and Montana, and it is estimated that the meeting will be attended by 150 members.

An outstanding feature of the meeting will be the exhibit of cakes, cookies, candies, preserves, canned fruits and other foods made with honey, accompanied by a long premium list.

An appeal is being made to the wives and daughters of members and to the lady members of the association to take an active interest in the approaching event as a means of interesting the general public in the wider uses of honey, according to Frank Rauchfuss, manager.

The committee on exhibits includes Mrs. V. J. Ramboz, Golden, Colo.; Miss Rosabell Rauchfuss, Englewood, Colo.; Mrs. Laura M. Steele, Aurora, Colo.; Mrs. W. M. Watters, Denver, and Mrs. John Wick, Broomfield, Colo.

Texas Meeting

The Texas Beekeepers' Association will meet in San Antonio, March 15, 1928. This meeting is to talk over a differential of prices on the spring honey crop. This is the first time that the State Association has ever attempted to take a hand in marketing work. This meeting has no object in view other than the giving of general information to the beekeepers who will attend. The facts relative to distance from market, kinds of honey and amounts available will be discussed and the beekeepers may or may not adopt a common price on honey. All beekeepers all over the State are urged to attend this meeting. An excellent program has been prepared and a good time is guaranteed.

H. B. Parks, Sec.

Dead Drones and Dead Workers

"The bees drive away the drones in the fall, so that they may die outside of the colony. The dead body of a drone is noxious to the bees. I have found entire colonies of workerbees dead giving but little smell, while the bodies of a couple dozen drones gave out a disagreeable odor of putrefaction.

"The poison of the workerbee spreads in her body after death and arrests decomposition. It is a wise precaution of nature that this poison should act as a disinfectant, to protect the living bees."—A Strauven, in Rucher Belge.

(There is some smell of putrefaction in dead workerbees, but much less than in dead drones, and we believe the above quoted writer is correct.—Editor.)



HONEY JARS

will sell your honey

Made of Clear Glass they give that increased sales value to your honey. No panels to catch shadows which darken the color. Beautiful in Clarity and Pattern and strength in Construction.

A trial will convince you!

SIZES

Individual, half pound, one pound & two pound
Accurate Graduation

DISTRIBUTORS

HOFFMAN & HAUCK OZONE PARK, N.Y.	THE A.I. ROOT COMPANY OFFICES - CHICAGO, ILL.	M.H. HUNT & SON LANSING, MICH.
A.G. WOODMAN CO. GRAND RAPIDS, MICH.	COUNCIL BLUFFS, IOWA	A.W. YATES HARTFORD, CONN.
	SAN ANTONIO, TEX. - ST. PAUL, MINN.	
	SYRACUSE, N.Y.	
	F. COOMBS & SON BRATTLEBORO, VT.	

HAZEL-ATLAS GLASS COMPANY

GENERAL OFFICES
WHEELING, W. VA.

Combless Packages Italian Bees

Prompt, satisfactory service. Health certificate with every shipment, and safe arrival guaranteed. Now booking orders. Deliveries to start April 15.

2-lb. packages with select young queen—1 to 24, \$3.50; 25 to 49, \$3.35; 50 to 100, \$3.10 each.

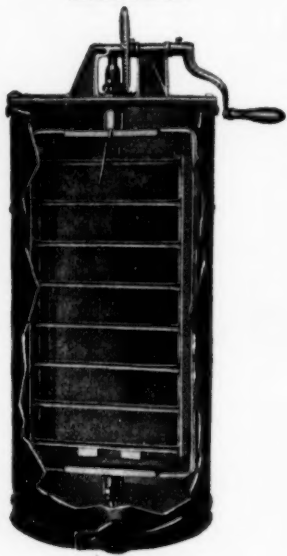
3-lb. packages with select young queen—1 to 24, \$4.50; 25 to 49, \$4.35; 50 to 100, \$4.10 each.

Queens—Untested, 1-9, \$1.00; 10-24, 95c; 25-49, 90c; 50-100, 85c each.

Homer W. Richard, 101 S. Jefferson, El Dorado, Ark.

Bee Supply Dealers Everywhere--

BACK-LOT



Pat. Pending

should sell the "Back-Lot" Single Frame HONEY EXTRACTOR (name copyrighted). We are **independent** manufacturers and distribute our extractors and honey storage tanks only through recognized Bee Supply Dealers—giving to them the protection to which they are entitled.

The "Back-Lot" Extractor, size No. 3, 9 1/2 x 16-inch basket, shipping weight 25 lbs., will go to the Beekeeper anywhere east of the Rocky Mountains at the astonishing low price of around \$9.00.

H. W. Smith, Junction City, Kans., writes:

"I have used your "Back-Lot" Extractor and it worked fine. I think it will be a good seller for the small bee man."

Allen Latham, Norwichtown, Conn., writes:

"I have tried out your "Back-Lot" Extractor and think it is a fine little machine for the small Beekeeper and shall recommend it for that purpose."

A Thorough Test

was made in our factory January, 1928, with the No. 3 "Back-Lot" Single Frame Honey Extractor. This test was made by Mr. Les Meyer, Apiary Inspector of the State of Michigan, with Mr. Clifford Muth of the Fred Muth Company, Cincinnati, Ohio, and two local beekeepers. Seventy pounds of honey was extracted during this test, and in each case over 98% of the honey

was extracted from each comb. The time operation for each comb being 2 1/2 minutes—the reel revolving in one direction half this time and in the opposite direction the other half—a practically continuous operation without removing the comb from the basket until all the honey was extracted.

Our Superior Two-Frame Reversible Honey Extractors

have already won their way until we are now the largest makers of hand power machines in the United States. We are using our 56 years of experience in business in reducing manufacturing costs so that the Beekeeper is saved from \$8.00 to \$20.00 in the cost of Honey Extractors.

Colorado Honey Producer's Ass'n., Denver, Colo.,

Mr. Frank Rauchfuss writes:

"Your 2-frame Reversible Extractors compare favorably with other makes selling at higher prices and they are giving good satisfaction to those who have bought them."

Charles Mondeng Co., Minneapolis, Minn., writes:

"We have found your Extractors truly a value and stand right in line with any others made and sold at a high price. Our customers who have purchased your machines are recommending them to their fellow Beekeepers."

F. J. Rettig & Sons, Wabash, Ind., writes:

"We want to congratulate you on your 2-frame Reversible Extractors. They are a wonder—well built in every way and have given good satisfaction to the Beekeepers, and the price puts them in reach of all."

The Diamond Match Co., Chico, Calif., writes:

"We are pleased to catalogue your Extractor, as it enables us to give customers better value for their money than any extractor on the market."

Our Guarantee

We give an absolute guarantee back of the "Back-Lot" Single Frame and our Improved 2-Frame Superior Reversible Honey Extractors, that they will perform the service for which they are intended and that they will prove entirely satisfactory to the Beekeeper to whom you sell them. Should there be any dissatisfaction or any complaint that our machines are not all that we claim them to be we will not argue the point, but will repay the freight and any expenses you have been to and you may ship the machine back at our expense.

Gulf Coast Bee Co., Houma, La., writes:

"We have put one of your Extractors to the severest test this season. We used it for mixing feed for the bees in transit over a period of four months—this was hard usage on the machine, but did not hurt it. We used this same Extractor to throw out the biggest crop of honey we ever had from 500 colonies. We are so well pleased with this Extractor that we will use only this 2-frame Extractor for the future, although we will materially increase the number of our colonies for 1928. Two points:

1—The gears are always in mesh and the simple way the handle is released and thrown into gear.

2—The exact balance that is put into the entire reel and basket assembly makes it run as smoothly as a steam engine."

The Fred W. Muth Co., Cincinnati, Ohio, writes:

"I am running your entire line of Extractors and Tanks with larger space than ever in our 1928 catalogue. The remarkable increase in our sales due to the excellent quality and reasonable prices of your goods justifies this extra effort."

THE STANDARD CHURN CO.
Wapakoneta, Ohio

Crop and Market Report

Compiled by M. G. Dadant

For March crop and market report, we asked reporters to answer the following questions:

1. How much honey left on hand?
2. How is it selling and will it all move?
3. Are prices holding steady or advancing?
4. Condition of bees so far.

HONEY ON HANDS

Conditions have not changed materially since the market report was written for our February issue, except, of course, that the usual amount of honey has been sold during the month which has passed.

There need be no anxiety over the amount of honey which will be held over in the New England States, nor in the states of the Atlantic seaboard.

The same rules true of all states south of the Ohio River, except Florida. Some large producers there have as much as half of their crop on hand. We believe that the amount on hand there is largely due to the fact that the producers were expecting as big a demand as in former years from local trade and this has not materialized. In other words, the Florida boom is not as big as it was. Texas has not over 15 per cent left.

New Jersey has considerable quantity of honey on hand, claiming about 25 per cent of the 1927 crop, and Pennsylvania has in the neighborhood of 25 to 40 per cent still on hand.

It is in the central western states, however, that the biggest quantity still remains. Indiana reports 30 per cent left, Illinois, 40 per cent, Iowa 35 per cent, Ohio 40 per cent, Michigan 25 per cent, Wisconsin 30 per cent, Minnesota 20 per cent, South Dakota 40 per cent, Nebraska 20 per cent, Kansas 20 per cent.

Outside of these states, there are none which have a very large quantity on hand. Possibly the amount left in Colorado is 15 per cent, and the same may average for one or two other intermountain states. New Mexico may be in about similar condition, but all of these states with that quantity left on hand should be able to sell out readily, or practically sell out, before the new crop materializes.

In looking over the reports coming in, one is struck by the fact that the quantity of honey left on hand is more of the nature of "distressed lots" held in the hands of beekeepers. While these distressed lots are certainly unfortunate for the beekeepers holding them, in most cases they have been held for a little relatively higher price than the carload market price as quoted by western producers. In other words, the western carload price of 7 to 7½ cents has not been commensurate enough for the Middle West apiarist who produces on a smaller scale, and he is wanting to obtain a somewhat better price for his honey, which would give him at least 9 cents per pound f. o. b. shipping point.

There are a few large producers, however, that would be willing to take a price of 8 cents per pound f. o. b. shipping point, but are unable to sell at this figure. We hear of one large Colorado producer holding one or two cars of honey, wanting 8 cents per pound f. o. b. shipping point, but is getting quotations of not more than 7 cents.

Undoubtedly there is going to be quite a considerable quantity of honey left on hand in the central western white clover area. I believe in a measure, however, that this is a premeditated move on the part of these beekeepers who have in years past gone through the same thing; that is, the big white clover years have always yielded an excess of honey which has to be carried over for lean years to follow. It will be a strange thing if white clover honey held over for one or two years in the extracted form does not finally yield the producer what he has expected and fair interest on his money.

All in all, for the entire country, we do not believe honey conditions are as bad as they were a year ago, even though the publishers of this paper are in an area

where there are a number of medium and large beekeepers holding a considerable part of their crop.

HOW IS HONEY SELLING—WILL IT MOVE?

No reports of honey selling briskly. This is to be expected, because there has been no concerted effort on the part of beekeepers, or any group of beekeepers, to stimulate consumer demand for honey. In these days of high advertising, when practically all products sold in a national way are advertised before the public and create a demand of themselves, it is not to be wondered at that a product like honey, which is not advertised except in a local way by a few progressive beekeepers, should be of slow sale.

Honey has been selling fairly well since the holidays, with a steady movement, and that is the best that can be said about it. The demand from foreign sources has been unusually good, which has in a measure saved the conditions in this country and prevented a slump in prices.

PRICE CHANGES

There have been very few price changes. We have reports from the central western area to the effect that beekeepers are inclined to accept a decline in prices in order to get rid of their crop during late winter or spring rather than hold it over. The same reports come from Florida. Equally discouraging reports also come in from the plains area comprising the states of South Dakota, Nebraska and Kansas. In a retail way the price cutter is still active.

There are very few reports of honey prices advancing, although we believe there is a possibility of a little stiffening in the carload price on honey and a little tendency on the part of some producers to hold a little longer until possibility of price advance materializes.

CONDITION OF BEES

Of course, it is a little early in the season yet to give any comprehensive report on how bees are coming through the winter. However, all reporters are alike in reporting desirable conditions of bees so far. Some of the intermountain states like Montana, Idaho, and Wyoming previously reported bees cooped up for two months or more, but since that time we have had mild weather, and we believe there have been flights in practically all states during the past three weeks. At least we have these reported from as far north as Alberta and Saskatchewan.

In some sections the mild weather has produced a shortage of stores, and this is reported from the states of Georgia, Florida, Alabama, Ohio, Michigan, Arizona, and Idaho.

One thing that has rather militated against the proper development of the clover is that the central west and eastern states have not had their usual quota of snow to cover the ground and keep the clover in good shape. In other words, we have had freezing and thawing weather which is apt to "heave" the clover and kill it before spring arrives.

At the date this page is being written, February 17, a snowstorm is in progress which we hope will cover the entire area to a fair depth, and that a moderate temperature will continue for a time at least so as to carry the clover along in good condition. Moisture has not been insufficient, but the weather has been too open for best wintering of clover plants.

Even so, we cannot feel pessimistic as to the possibilities of clover production next year. In Florida and Georgia, and on the west coast, maples are blooming and bees are gathering some pollen.

All in all, while there can be no attitude of optimism over the selling of the present crop of honey, owing to the rather medial price obtained, still we believe the bulk of the crop is going to be out of the way and that there will be no sufficient holdover to cause any worry for the coming 1928 season.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

As a measure of protection to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisements of used beekeeping equipment or of bees on combs must be accompanied by a guarantee that the material is free from disease or be accompanied either by a certificate of inspection from an authorized inspector or agreement made to furnish such certificate at the time of sale.

BEEES AND QUEENS

TWO-POUND packages Italian bees with tested Italian queen for \$3.50; three-pound packages, \$4.50. Free from disease. Safe delivery guaranteed. Let me book your orders now. Clyde Cobb, Belleville, Ark.

200 FOUR-FRAME nuclei with extra pound of bees and tested queens, \$4.00 each. Evangeline Apiaries, New Iberia, La.

BEEES AND QUEENS—Two pounds of bees with queen, \$2.90; three pounds, \$3.80, in quantities. See my large ad, page 156. H. E. Graham, Cameron, Texas, Box 735.

PACKAGE bees with queens or without young bees; no drones, full weight, syrup feeder in cage. Two-pound package with untested queen, one to ten, \$3.50; ten or more, \$3.25. State inspection certificate attached. Prompt delivery. Satisfaction guaranteed. Little River Apiaries, Gause, Texas, Box 83.

GOLDEN Italian queens that have the other qualities desired in bees as well as the golden color. Prices, untested, 1, \$1.05; 6, \$5.50, 12 to 49, 80c each; 50 or more, 75c each, with health certificate and safe arrival. Hazel V. Bonkemeyer, Route 2, Randleman, N. C.

QUEENS—Place your order at once for our famous select untested laying Italian bees, guaranteed in every particular, at the following prices: One, \$1.00; 12, \$10.00; 100, \$80.00. First shipment of 1928 queens March 1. We devote our time exclusively to the producing of the best queenbees possible. No bees in packages, nuclei, etc. Edson Apiaries, P. O. Box 701, Gridley, Cal.

PACKAGE BEES—Hardy Northern. Van's Honey Farms, Hebron, Indiana.

GERMAN bee shipper. Bees and queens in pound packages, leather-colored Italians. If you want good bees, prompt service and fair treatment, give me a trial. Shipped on sugar syrup without comb. Two-pound package with untested queen, \$3.50; ten or more \$3.25. No disease. Health certificate attached. Ten per cent books orders. Satisfaction guaranteed. William Piefer, Gause, Texas.

BEEES and queens for sale. The 1928 bee season is near at hand. Look out for your wants and let us figure with you. We have some of the best bees and queens that are raised. Prices are right. Queen bees \$1.00 each; \$10.00 per dozen; \$70.00 per hundred. One pound of bees with queen, \$2.75; two pounds of bees with young queen, \$4.50. All charges paid. Graydon Bros., Greenville, Ala., Route No. 4.

TO begin over again with reconstruction bees. Stock of breeders from all over states to select from insures you of good selected three-banded bees and queens. After shipping bees for 17 years on a large scale to begin in this small way gives you the benefit of our experience. We invite correspondence with anyone having claims against us. Two-pound package with queen on comb or combless \$4.00, 10 2-pound with queens \$37.50, 1 3-pound with queen \$4.75, 10 3-pound with queens \$45.00. Shipping to begin April 20th. Certificate of health issued. Safe delivery. Central La. Apiaries, Oscar Mayeux, Prop., Hamburg, La.

FOR satisfaction order your package bees and queens from P. M. Williams. They are bred for honey production, packed right and will reach you in good condition. Two-pound packages of young bees with select untested Italian queens, one to four, \$3.50; five to nine, \$3.40; ten or more, \$3.25. Select untested Italian queens \$1.00 each, six for \$5.50, dozen \$10.00. Health certificate with every shipment. Satisfaction guaranteed. P. M. Williams, Mt. Willing, Ala.

PACKAGE BEES—Hardy Northern. Van's Honey Farms, Hebron, Indiana.

GOLDEN Italian queens that produce golden bees, very gentle, good honey gatherers. State inspected. Safe arrival, satisfaction guaranteed. Ready now. Tested, \$1.50; select tested, \$2.50. Untested, about May 1, \$1.00; six for \$5.40; twelve or more, 80 cents each. D. T. Gaster, Randleman, N. C., Route 2.

WILL exchange package bees for good real estate, or anything valuable. Van's Honey Farms, Hebron, Indiana.

PACKAGE bees and queens. Pure Italian stock. Reduced prices for May delivery. The Crowville Apiaries, Crowville, La.

LATHAM'S "She-suits-me" untested three-banded, \$1.50 by return mail; \$1.00 if booked in advance. Queens ready about May 20. Allen Latham, Norwichtown, Conn.

WANTED—To book orders from 300 to 500 packages pure Italian bees and queens for April and May delivery. O. P. Hendrix, West Point, Miss.

MOTT'S northern bred Italian queens are guaranteed to be purely mated, or will replace free. April and May, \$1.25; after June 1, \$1.00 each. See list for quantities. E. E. Mott & Son, Glenwood, Mich.

WHY take chances by waiting till the last minute to place your order for bees and queens? In the last minute rush some orders will probably be turned down or delayed while filling earlier orders. Why let your order be one of these? Place your order now and be assured of prompt shipment as well as the best quality. Safe arrival and satisfaction guaranteed. Health certificate with each shipment. Write for descriptive circular and price list, also price on quantities. J. M. Cutts & Sons, Montgomery, Ala., R. No. 1.

WARD'S bright Italian queens \$1.00 each, May and June. A few three-pound packages with queens, \$4.00 each. C. W. Ward, Rt. 1, LeRoy, Kans.

GOLDEN UNTESTED QUEENS—Gentle and good honey gatherers as can be found, \$2.00 each. Tested, \$4.00 each. Best breeders, \$20.00. Over thirty years a golden Italian breeder. J. B. Brockwell, Barnetts, Va.

LISTEN—If you wish to purchase high grade Italian queens, write for circular describing our famous Carolina queens. Every queen guaranteed to give satisfaction. One to five, \$1.00 each; six to twenty-four, 85c; twenty-five to fifty, 75c. Carolina Bee Co., W. O. Curtis, Mgr., Graham, N. C.

CAUCASIANS—If they are Quinn's, they are pure; they hold the world's record for both comb and extracted honey. Most gentle of all bees. Carniolans in their purity, Italians that are bred, not merely raised. Prices: Untested, \$1.50; select untested, \$2.00. Tested, \$2.50; select tested, \$3.00. Ten per cent off on lots of one dozen. Special prices on lots of 100, 500, 1999. Are you interested in a long tongue reach? If so, try Quinn's bees. Charles W. Quinn, C. E., the breeder of queens, Box 14, Englewood, Fla.

AMERICAN BEAUTY Italian bees and queens. Two-pound combless package and queen, \$4.00 each. Special, 2½ lbs. bees on frame sealed brood and honey with queens introduced and laying enroute, \$4.75. Health certificate and satisfaction guaranteed. Tupelo Apiaries, J. L. Morgan, Prop., Apalachicola, Fla.

GOLDEN THREE-BANDED and Carniolan queens. Tested, \$1.00; untested, 75c each. Bees in 1-pound package, \$1.50; 2 pounds, \$2.50; 3 pounds, \$3.25. Safe delivery guaranteed. C. B. Bankston, Box 65, Buffalo, Leon Co., Texas.

OUR weights hold out. R. V. Stearns, Brady, Texas.

FROM April 1—Two-pound packages and queen, six for \$20.00; three-pound packages and queen, six for \$25.00. Nuclei the same. The Vidalia Apiaries, Vidalia, Ga. Rev. Curd Walker, Prop.

THE Peerless Strain—Vigorous, gentle Italian. 1928. One 2-lb. package with young queen, \$3.75; from 10 up, \$3.50 each. One 3-lb. package with young queen, \$5.00; from 10 up, \$4.50 each. One 4-lb. package with young queen, \$6.00; from 10 up, \$5.50 each. Packages are shipped combless with sufficient feed for transit. If you wish to have your bees shipped on comb, add 25 cents for each comb. A 2-frame nucleus with young queen, \$4.25; from 5 up, \$4.00 each. A 2-frame nucleus with two pounds of bees and queen, \$6.00. Special: For those who have only a short time for the bees to build up before the main honeyflow, a 4-lb. package with two good frames of brood and young queen, \$7.00; five packages, \$32.50. Order now; you will be pleased. The Peerless Apiaries, Box 54, Marksville, La. Rev. John P. Cooney, Prop.

FINEST Italian queens, bees, supplies and sweet clover seed, for less money, freight prepaid. Holloways Apiaries, Marietta, Okla.

FOR SALE—Italian bees in 2-pound packages with queens, \$3.00 each. Health certificate with each shipment. Satisfaction guaranteed. Write me. J. L. Leath, Corinth, Miss.

NEW LOW PRICES

New low prices on packages and nuclei bees, from one package to several thousand, very cheap prices. Please let us quote you prices before purchasing your bees. We believe that we can save you money and that you will be more than pleased for the following reason: We will ship you absolutely FREE with each package you order from us this month a one-frame nucleus. No drones. Overweight allowed for shrinkage. Young, choice queens. Safe delivery, satisfaction, no diseases guaranteed. First-class references furnished from customers all over the United States, Canada and even Cuba. We are one of the largest and oldest shippers in Louisiana. We have a good offer for several large buyers. Write or wire us at our expense for further particulars. M. J. Voinche, Bunkie, La.

WE ship on time. R. V. Stearns, Brady, Texas.

BOOKING package bees for May delivery. Four pounds with untested queen, \$5.00; five pounds, \$6.00. Only a limited number to offer. Student's Bee and Honey Co., Berkeley, Calif.

PACKAGE bees and queens. Untested daughters of Honey Girl breeder. Charles Wallace, Box 44, Rt. 1, Glenn, Calif.

PACKAGE BEES—Hardy Northern. Van's Honey Farms, Hebron, Indiana.

SPECIAL PRICES to new customers on our best honey gathering strain of Italian bees. Write for circular or see display ad elsewhere in this Journal. Blue Bonnet Apiaries, Mercedes, Texas.

POUND package bees with 1928 Italian queens. Two-pound packages, \$3.50; three-pound packages, \$4.50. Satisfaction guaranteed. Overbey Apiaries, Leonville, La.

LEATHER-COLOR three-banded Italians for early spring shipments. Delay means disappointment, so book orders now and get a hearing from us assuring you of the shipment to suit your convenience. One to ten two-pound packages, \$2.75. Additional pound to package, \$1.00. Select untested queens, \$1.50; with package, \$1.25. Discounts on big orders. Twenty per cent down on small orders. Safe arrival and satisfaction guaranteed. Moncla Bros. Apiaries, Moncla, La.

PACKAGE BEES—See our ad on page 148 or write for particulars. Louisiana Southern Bee Farm, Baton Rouge, La.

WANTED—Beeswax and honey in exchange for bees and queens. Write for prices. Blue Bonnet Apiaries, Mercedes, Texas.

PACKAGE BEES—One dollar per pound. Queens from imported Cyprian queen, \$1 each. E. J. Vaught, Oakland, Calif., 3433 Chestnut Street.

GLADIOLI BULBS—Our 100 named kinds No. 1 size for queens or package bees or modern bee supplies. N. S. Kibble, Boise, Idaho, 1915 North Eighteenth.

GOLDEN Italian queens and nuclei (or package bees) for 1928. The big, bright, hustling kind (the kind that get the honey). Satisfied customers everywhere. Untested, \$1.00 each; 6 for \$5.00; 12, \$10.00; 100, \$75.00. Tested, \$2.00 each. Two-frame nuclei or two-pound package with queens, \$4.50 each; ten or more, \$4.00 each. Safe arrival guaranteed. Health certificate furnished. E. F. Day, Honorville, Ala.

PACKAGE bees and queens. If you want bees and queens, place your order early. We are now booking orders for 1928. Get our prices before buying. We guarantee safe delivery and satisfaction. Health certificate and all necessary papers with each shipment. The Mangham Apiaries Company, C. S. Duncan, Prop., Mangham, Louisiana.

EARLY package bees and select young laying Italian queens. The kind that will pay you a profit the first season. Attractive prices on orders placed in advance. Our northern location will save you both time and express charges. Let us quote you on any size order, either f. o. b. here or delivered to your station. We guarantee safe arrival and delivery on time. Circular free. J. E. Wing, Cottonwood, California.

THRIFTY CAUCASIANS—Booking orders for three-frame nuclei, also queens for May delivery. Yard inspected regularly for protection of diseases. Peter Schaffhauser, Havelock, N. C.

CAUCASIAN QUEENS from imported stock. Select untested \$1.50 each for balance of season. Now booking orders for 1928 delivery. Tillery Bros., Greenville Ala., Rt. 6.

IT will pay you to see my display on page 134. Jes Dalton.

HIGHEST grade Italian queens—Tested, \$1.50; untested, 75 cents. Package bees, one pound, \$1.50; two pounds, \$2.50; three pounds, \$3.25. Have had no disease. State inspection certificate with each shipment. Safe delivery guaranteed. T. L. Davis, Buffalo, Leon Co., Texas.

TRY our high class queens and get the honey. We sell only the best selected Italians, guarantee safe arrival and complete satisfaction in every way. Our queens are personally reared and we want you to try them. Prices are \$1.00 each; 6 for \$5.50; 25 at 80c each, and 50 or more 75c each. Salida Apiaries, T. L. Nicolayson, Prop., Salida, Calif.

LEATHER COLORED ITALIAN QUEENS—\$2.00; after June 1, \$1.00. Tested, \$2.00. A. W. Yates, 15 Chapman St., Hartford, Conn.

FOR SALE

FOR SALE CHEAP—Twenty colonies of bees in ten-frame hives. Honey in hive will pay for them. Four-frame reversible extractor. B. H. Barnes, Louisville, Ky., 1832 Deerwood Ave.

FOR SALE—500 colonies bees and equipment for comb, extracted or chunk honey, all in good standard eight-frame hives. Located in heart of sweet clover district of San Luis Valley of Colorado. L. W. Howsam, La Jara, Colo.

FOR SALE—27 standard ten-frame hives with metal covers, 50 supers, miscellaneous equipment. None used over two seasons; some new. Reasonable. Write for full particulars. Ralph Hay, Northville, Mich.

HUBAM \$12.50 per bushel; white sweet clover \$6.00. Re-cleaned and scarified. P. Petersen, Kimballton, Iowa.

VITEX seed for sale. One-quarter ounce, 50c; one ounce, \$1.50, postpaid. Help the bees help you. Joe Stallsmith, Galena, Kans.

200 COLONIES of bees and equipment, a few eight-frame colonies, rest in ten-frame; four super equipment, about eighty extracting supers, two-frame extractor. White clover prospect fine. Disease free. Olan Tackaberry, Cantril, Iowa.

ROOT-COWAN extractor, baskets 12x16 inches; Lewis 100-gallon tank, capping melter, uncapping knives, honey warmer, three-burner kerosene stove, double-beam platform scale, twelve cases five-gallon cans, seven dozen quart jars, platform push cart, all for \$85.00. L. C. Worth, Lilbourn, Mo.

AS I wish to move to Minneapolis, Minn. I will sell cheap 60 colonies of fine Italian bees. They are gentle, fine workers, and no disease. In good average well painted hives. Bees averaged 110 lbs. fine clover honey last season. Are kept right in town only a block from Maine street. Price, eight-frame, \$5.00; ten-frame, \$6.00; 300 supers at 50 and 60c, no sections. George F. Schilling, State Center, Iowa.

FOR SALE—28 colonies of bees with equipment for 100 more. Will sell all or part. Very cheap. Mrs. E. Bjorkman, Dawson, Minn.

FOR SALE—40 colonies Italian bees, 20 Dadant, 20 ten-frame, requeened last fall. All in first-class condition. W. A. Wainright, Jacksonville, Ill.

FOR SALE—New six-room house, large honey house, two-car garage, 150 colonies bees with full equipment for comb and extracted honey; four acres ground, ideal for bees and poultry, just outside of city limits of Virginia. Priced for quick sale. O. R. Matthew, Virginia, Ill.

FOR SALE—20 colonies of bees with equipment, in A-1 shape, at a reasonable price. Domenick Tarro, Taylorville, Ill.

GENERAL NURSERY—64 new fruits, etc., cantaloupe flavored plums, peach, apple. Hardy. Cheap. Catalog. Vikla Nurseries, Lonsdale, Minn.

FOR TRADE—One 1200-egg super hatcher incubator for ten stands of bees. Write Daniel M. Yoder, Mylo, N. D.

FOR SALE—Foundation, books, bee brushes, comb, hives, cartons, feeders, nailed and painted bodies, bottoms, covers and bodies, veils, sections, a big assortment of frames, excluders, comb and extracting supers k. d., and many other items in good usable condition. Reason for selling items, no longer listed in our catalog. Prices the lowest anywhere for the value. You can address G. B. Lewis Company at Watertown, Wisconsin; Albany, New York; Lynchburg, Virginia; Texarkana, Arkansas, or Sioux City, Iowa.

DAHLIAS—14, all different, \$1.50. List of names, varieties free. Gladiolus, 50 assorted, \$1.00, postpaid. Busy Bee Apiaries, Chillicothe, Ill.

TRY Pinard's labor-saving nailless queenbee shipping cage. Send for circulars. A. B. Pinard, R. 1, Box 1, San Jose, Calif.

FOR SALE—Slightly discolored hives, complete with tops, bottoms and Hoffman frames, ten-frame size, at \$9.80 per crate of five. Sold with factory guarantee. Full-depth ten-frame supers with frames \$1.00 each; ten-frame comb honey supers complete, 75 cents each. Hoffman self-spacing frames with heavy corner cut top bars, \$4.75 per hundred. Manufactured by one of the largest factories of bee supplies in the world, and became discolored in shipment by barge on Mississippi River. Send all orders to St. Louis Apiary Supply Co., 308 Commercial Bldg., St. Louis, Mo.

COMB HONEY producers using a Rauchfuss combined section press and foundation fastener, write me for free information regarding improvement on your machine guaranteed to enable you to fold more sections per hour, do better work, and keep sections from being spotted up with melted wax which runs down from the hot-plate. C. Holm, Prop. Base Line Bee Farm, Genoa, Illinois.

FOR SALE—100 colonies of bees, together with equipment for 200 more. Unexcelled location for 1,000 colonies. Standard ten-frame. Sell all or part. B. F. Kindig, East Lansing, Mich.

FIRST-CLASS, used extracting equipment for sale. Extractors, honey tanks, pumps, etc. Write for list. C. S. Engle, 1327 Twenty-third St., Sioux City, Iowa.

FOR SALE OR TRADE—Beeman garden tractor, Barnes power saw, also 32-volt generator. What have you? Dale Ward, Rushville, Ill.

FOR SALE—Famous white Tupelo belt apiary. Owing to other business, I will sell one of my choicest apiaries with 100 or more colonies of bees, fully equipped. Ideal location for northern man for early packages and queens and spend his winters in Florida. J. L. Morgan, Apalachicola, Fla.

FOR SALE—300 stands of bees just requeened, choice three-band Italians, two supers to each hive. No disease; inspector's certificate. Excellent orange and sage locations. Portable extracting house and tanks. Low cash price. Address Robert E. Miller, Rialto, Calif.

FOR SALE—Eighty colonies of Italian bees in eight- and ten-frame hives. Guaranteed healthy. Anthony P. Kilmalis, Hoosick Falls, N. Y.

THIRTY-SEVEN colonies of bees and entire equipment at half price. J. B. Lockey, Island Grove, Fla.

BEST quality pine Hoffman self-spacing frames, \$42 per 1,000. Best dovetailed hive bodies, 25 or more, 60c each. Let us quote you on other items you will need. The Stover Apiaries, Tibbee Station, Miss.

FOR SALE—Used extractors; one Simplicity, one 4-frame Lewis-Markle, one Root 4-frame hand, one 2-frame hand. All like new. Beeware Smith, Fromberg, Mont.

FOR SALE—Soiled cane granulated sugar for bee feed. Winkler Honey Co., Joliet, Ill.

FOR SALE—160 colonies bees in 8- and 10-frame hives, with equipment. Guaranteed healthy and in good condition. Frank Schwab, Blanca, Colo.

BEES for sale. I have for sale 100 or more colonies of bees located 100 miles north of Sacramento, in the star-thistle region. Average extracted honey crop per colony in past few years over 120 pounds. Location would go with bees. All bees in double-story colonies and guaranteed free from disease, with ample stores. If interested, write L. B. Heath, Box 9, Chico, Cal.

FOR SALE—We are constantly accumulating bee supplies, slightly shopworn, odd sized, surpluses, etc., which we desire to dispose of and on which we can quote you bargain prices. Write for complete list of our bargain material. We can save you money on items you may desire from it. Dadant & Sons, Hamilton, Illinois.

HONEY AND BEESWAX

WANTED—Honey in five-pound pails. F. S. Chatham, Wholesale and Jobber, Carbondale, Ill.

WANTED—Extracted honey in ten-pound pails at 10c pound, in exchange for chicks. Catalog and price list. Ames Hatchery, Deerfield, Wis.

CLOVER and amber extracted and comb honey for sale. W. C. Moon, Henry, Ill.

CHOICE clover honey in 60-lb. cans. Arthur Beals, Oto, Iowa.

CLOSING out sale of honey. Three kinds; free samples to buyers. One can, \$5.00; \$9.50 per case; 50 or 100 cases to bottlers a greater reduction. Delbert Lhommedieu, Colo, Iowa.

FOR SALE—Light amber fall honey (heartsease) in 60-lb. cans, any quantity. Sample 15c. E. S. Miller, Valparaiso, Indiana.

FINE quality clover honey in new 60-lb. cans, well ripened. Attractive prices on large lots. Leland Farnsworth, Davison, Mich.

FOR SALE—Fancy white clover honey in new 60-lb. cans at 9c per pound; twelve five-pound pails, \$7.50. Discount on large lots. Joseph H. Hoehn, Ottoville, Ohio.

WINKLER'S light amber honey in 60-pound cans at 9c pound. Reduced prices on lots. Sample prepaid, 20c. Winkler Honey Co., Joliet, Ill.

WANTED—Ton sweet clover honey. Must be within trucking distance. Will furnish own containers. Wm. Burton, Croton, S. D.

WHITE and light amber in sixties. Prices to sell. C. A. Wiggins, Byron, Mich.

PARTIES wishing extra fine honey any time, write Lee Horning, a producer, Morrison, Illinois.

HONEY in sixty-pound cans. Buckwheat 7c, white clover 11c.

F. J. Smith, Castalia, Ohio.

FOR SALE—White clover and amber comb honey. Write for prices.

Hubert Rice, Memphis, Mo.

WHITE clover comb honey. Write for prices. W. L. Ritter, Genoa, Ill.

FOR SALE—5,000 pounds extracted clover honey, white and light amber, in 60-pound cans, crystallized.

Frank Schwab, Blanca, Colo.

DELICIOUS amber honey, 9c pound; 120 pounds to case.

Oplinger Bros., Walkerton, Ind.

FOR SALE—White honey, 120-pound cases. Sample 15c.

Ralph Lenosky, East Jordan, Mich.

NUMBER ONE clover honey, white, in 60's. State quantity wanted. Sample 15c.

Edw. Hassinger, Jr., Greenville, Wis.

HONEY for sale. No. 1 white comb and extracted. Write

C. H. Phillips, LeClaire, Iowa.

EXTRACTED clover honey, grade one. Two 60-pound cans, \$12.00. Special price on larger lots. State amount wanted. Adolph Seymer, 1155 29th Ave., Milwaukee, Wis.

WANTED—Beeswax, old combs, cappings, slumgum. Write for shipping tags. "Don't pass the buck." Get your foundation and supplies right.

The Carl F. Buck Co., Walla Walla, Wash.

WHITE CLOVER in 60-lb. cans, two to case, 9c per pound. Also light amber, 7½c. Sample 15c.

Sylvester Legat, Spring Valley, Ill.

EXTRACTED honey in 5- and 10-lb. pails and 60-lb. cans. Let me quote prices on your needs. A. L. Kildow, Putnam, Ill.

OHMERT'S HONEY—None finer; 9c, new 60's. Sample. Also comb and chunk honey. Ohmert & Son, Dubuque, Iowa.

MICHIGAN'S best extracted honey; clover, raspberry, milkweed. In 60-lb. cans and other packages, quantities to suit, at prices within the market.

A. G. Woodman, Grand Rapids, Mich.

WHITE CLOVER HONEY—Extracted, comb and chunk honey. Prices on request. Sample 15c.

F. W. Summerfield, Waterville, O.

EXCEPTIONAL quality clover honey. Clear, white, thick, mild and delicious. Fast retail seller. Inquire price.

Newman I. Lyle, Sheldon, Iowa.

FOR SALE—Finest quality white clover honey in new 60-pound cans.

Martin Caramoe, Ruthven, Iowa.

FOR SALE—White clover honey in 60-lb. cans. None finer. Satisfaction guaranteed.

J. F. Moore, Tiffin, Ohio.

WANTED—A car or less quantity of white honey in sixty-pound cans. Mail sample and quote lowest cash price for same; also send for my cut price circular on cans and pails for honey containers.

J. S. Bulkey, Birmingham, Mich.

FOR SALE—Large stock first-class white clover, sweet clover, basswood, light amber and buckwheat extracted honey. Producers who need more, dealers and solicitors should write us about their wants.

A. I. Root Co. of Chicago,

224 W. Huron St., Chicago, Ill.

EXTRA fine, well refined clover honey in 60-lb. cans. Prices on request.

E. J. Stahlman, Grover Hill, Ohio.

FANCY white tupelo extracted and bulk comb, packed in five-pound tin.

J. L. Morgan, Tupelo Apiaries, Apalachicola, Fla.

FOR SALE—Northern white, extracted and comb honey.

M. W. Cousineau, Moorhead, Minn.

EXTRACTED HONEY—Extra fancy, white clover; 60 lb., 13c pound; six 10-lb. pails, \$9.00; twelve 5-lb. pails, \$9.60.

Kalona Honey Co., Kalona, Iowa.

FOR SALE—Choice clover extracted honey packed in new 60-pound cans and cases.

J. D. Beals, Dwight, N. Dak.

FOR SALE—No. 1 white comb, \$4.50 per case, 24 sections to case, six cases to carrier. Clover extracted, 10c pound; dark, 7c. Two 60-lb. cans to case.

H. G. Quirin, Bellevue, Ohio.

FOR SALE—Fine quality clover honey in new 60-lb. cans.

Sundberg Bros., Fergus Falls, Minn.

HONEY FOR SALE—In 60-lb. tins. White clover at 12c lb.; white sage at 12c lb.; white orange at 13c lb.; extra L. A. sage at 11c lb. Hoffman & Hauck, Inc.,

Ozone Park, New York.

FOR SALE—White sweet clover extracted honey and fancy white comb in shallow frames. Quality goods that will please your trade. Write for prices.

The Colorado Honey Producers' Ass'n, Denver, Colo.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans. State quantity wanted and we will quote prices. Samples on request.

Dadant & Sons, Hamilton, Illinois.

HONEY FOR SALE—Any kind, any quantity. The John G. Paton Co.,

217 Broadway, New York.

SHALLOW frame white comb honey and white extracted honey.

The Colorado Honey Prod. Ass'n,

Denver, Colo.

SUPPLIES

COMB foundation, bee supplies manufactured. V. Soharev, Slocan, B. C.

HIVES, covers, bottoms and frames, standard or made to your order. Write for prices. High Line Apiaries, Glen Flora, Wis.

COMPLETE hives, hive bodies, bottom boards, covers, frames, all kinds. All new and made of the best material. Dirt cheap. Send list of what you need. The Stover Apiaries, Tibbee Station, Miss.

ROBINSON'S comb foundation will please the bees, and the price will please the beekeeper. Wax worked at lowest rates.

E. S. Robinson, Mayville, N. Y.

"BEEWARE" and Dadant's Wired Foundation for the Northwest. Catalog prices. F. O. B. Fromberg, Montana. Beeswax wanted. Write for prices.

B. F. Smith, Jr., Fromberg, Mont.

BEST QUALITY bee supplies, attractive prices, prompt shipment. Illustrated catalog on request. We buy beeswax at all times and remit promptly.

The Colorado Honey Producers' Ass'n,

Denver, Colo.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed. We have large stocks of these on hand. Please write for prices if interested. We are offering only good cans and good cases.

C. H. W. Weber & Co., Cincinnati, O.

MISCELLANEOUS

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.

American Bee Journal, Hamilton, Ill.

MAKE queen introduction sure. One Safin cage by mail, 25c; 5 for \$1.00.

Allen Latham, Norwichtown, Conn.

YOU can read in either English or French the report of the Seventh International Congress of Beekeepers held at Quebec September 1-4, 1924. Not more than a dozen copies left. Orders filled in rotation. Postpaid, \$2.25. American Bee Journal.

THE DADANT SYSTEM IN ITALIAN—

The "Dadant System of Beekeeping" is now published in Italian, "Il Sistema d'Apicoltura Dadant." Send orders to the American Bee Journal. Price \$1.00.

GLEANINGS IN BEE CULTURE, published at Medina, Ohio, is the most carefully edited bee journal in the world. Its editor-in-chief is George S. Demuth. Its field editor is E. R. Root. Ask for sample copy.

WESTERN HONEY BEE, 2823 E. 4th St., Los Angeles, Calif., published by Western beekeepers, where commercial honey production is farther advanced than in any other section of the world. \$1.00 per year. Send for sample copy.

WANTED

WANTED—Position wanted by young man experienced in the care of bees. Florida preferred. Apply to Warren R. Ionson, 109 Worcester St., Boston, Mass.

WANTED—Good second-hand hives, also power extractor, honey tanks and pump. H. Herzog, Ulen, Minnesota.

WANTED—Modified Dadant hives, in good shape, cheap.

Theodore Schedel, Pittsfield, Ill.

WANTED—Position by young man for coming season. Three years' experience.

Leonard Robins, Mt. Sterling, Ill.

WANTED—One experienced beekeeper and one helper for 1928 season. Give full information and wages expected.

W. J. Forehand, Fort Deposit, Ala.

EXPERIENCED, able-bodied man for extracted honey, 1928. State age, experience and wages expected.

B. F. Smith, Jr., Fromberg, Mont.

WANTED—Good bee man for following season. State experience, wages wanted, etc. Address RHL, American Bee Journal.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering.

Fred W. Muth Co.,

204 Walnut St., Cincinnati, Ohio.

RABBITS

RABBITS—Make big profits with Chinchilla rabbits. Real money makers. Write for facts. 824 Conrad's Ranch, Denver, Colo.

DISTRIBUTORS OF

DADANT'S FAMOUS FOUNDATION

LEWIS BEEWARE SUPPLIES

Choice of Expert Beekeepers Everywhere

Write For Our New Spring Catalog

JOB P. WYATT & SONS CO.

RALEIGH, N. C.

SUNNY LAND BEES and QUEENS

LIGHT THREE BAND ITALIAN

April Delivery. State inspected. Safe delivery and satisfaction guaranteed.

Two-pound combless package with untested queen, \$3.50; ten, \$34.00; twenty-five, \$83.25; fifty, \$165.00; hundred, \$325.00. Three-pound package \$1.00 more than two-pound package. Two- and three-frame nuclei with untested queen same price at package, respectively. Vigorous and profitable untested queens \$1.00 each; dozen, \$10.00; hundred, \$67.00.

We solicit your patronage on the merits of our quality service and price.

CRENSHAW COUNTY APIARIES

Rutledge, Alabama

CARNIOLANS



are very gentle, very prolific at all times, build very white combs, are little inclined to rob, rarely affected with European foulbrood, and are most excellent workers. Average surplus from producing colonies during 1927 was 180 pounds extracted.

We have been breeding Carniolans for the past 21 years. Several breeders imported each year—Jan Stargar and M. Ambrosic stock. We have supplied queens to several State Agricultural Colleges and Experiment Stations and to the Japanese Government for breeding purposes. We probably have the finest Carniolans in the United States.

We will supply queens in season, also a limited number of two-pound packages and eight-frame colonies with tested queens. Ask for prices and our paper, "MERITS OF THE CARNIOLAN BEE."

ALBERT G. HANN, Glen Gardner, N. J.

Achord Combless Packages and Queens

Soon make colonies you will be proud to own

We produce and ship only the best of pure three-banded Italians. We give you more than full weight of healthy, young bees.

Two-pound packages with select 1928 laying queens, \$4.25 each; five or more, \$4.00 each.

Three-pound packages with select 1928 laying queens, \$5.25 each; five or more, \$5.00 each.

If packages are wanted without queens, deduct \$1.00 from the price of each.

Shipments will start early in April and will have inspection certificates and all papers necessary to deliver them at destination without delay.

SELECT 1928 LAYING QUEENS \$1 EA. ANY NUMBER

Tested queens, \$1.75 each

Select tested prospective breeding queens, \$2.50 each

We have been shipping bees and queens for many years and can give you the very best in bees, queens and service. Write us your needs for the new year.

W. D. ACHORD, Fitzpatrick, Alabama

Save Time -- Save Worry

Dadant's Wired Foundation

Can be nailed into Lewis Slotted Bottom Bar in a jiffy. And such wonderful combs!

Sold by all Dealers in Lewis
Beware and Dadant's Foundation

10,000 QUEENS

FOR 1928 DELIVERY
Guaranteed to be the equal of any queens now on the market

Booking orders now

HERMAN McCONNELL
(The Bee and Honey Man)
Robinson, Ill.

EARLY MARCH QUEENS

Send me your order, \$1.00 each

Lower price for quantity

D. W. Howell - Shellman, Ga.

HODGSON'S RADIAL HONEY EXTRACTOR

HAS BEEN A SUCCESS FROM THE FIRST

The man who bought the second machine wrote us recently:

"Might say that the Radial Extractor is still running fine. Have extracted around six tons already this season, of mostly pretty cold honey, and have only broken one comb."

Manufactured by

S. P. HODGSON & SONS

NEW WESTMINSTER,

British Columbia, Canada

SHAW'S BEES AND QUEENS

Are Seldom Equaled and Never Surpassed

No disease here—never has been. I ship in light cages on sugar syrup. All packages 10 to 20 per cent overweight when shipped. Young three-band Italian bees and queens. I guarantee all queens to be purely mated. I also guarantee you will get them when you want them. If there are any losses, I assume them and give prompt replacement or refund. Your order booked without deposit.

PRICES

Two-pound pkgs. with young queens:
1 to 24, \$3.50; 25 to 49, \$3.35; 50 to 100, \$3.10.

Three-pound pkgs. with young queens:
1 to 24, \$4.50; 25 to 49, \$4.35; 50 to 100, \$4.10.

Queens, as good as the best: 1 to 9, \$1.00; 10 to 24, 95c; 25 to 49, 90c; 50 to 100, 85c each.

A. E. SHAW

SHANNON, MISS

BOOKING ORDERS

for high-grade three-banded Italian bees and queens: 2-lb. package with select untested queen, \$4.50; discount on quantity. Select untested, \$1.00, \$10.00 per dozen; select tested queen, \$1.50. Inspector's certificate with each.

J. ALLEN, Catherine, Alabama

F. J. RETTIG & SONS

BEEKEEPERS' SUPPLIES

455-485 W. Canal St., Wabash, Ind.

5 lbs. Medium Brood Foundation	\$3.50
5 lbs. Thin surplus	3.85
5 Ten-frame One-story Hives	10.00
100 Hoffman Frames	4.75
500 4 1/4 x 4 1/4 x 1 1/4 No. 1 Sections	4.75
2-Fr. Ball-bearing Revers. Ext'r	23.50
5 Eight- or Ten-frame Escape Boards	1.15
5 Eight- or Ten-frame Supers fitted for sections or frames	3.75
5 Tops, eight- or ten-frame, wood	2.95
5 Bottoms, eight- or ten-frame	2.90
10-Inch Hive Tool	.50
100 Scalloped Wood Separators	1.15

Write for our 1928 catalogue and get all our prices. Send in your old comb and cappings; we will render them for 5c a pound and pay you the highest market price for your wax or any you may have.



FOR OVER 50 YEARS

Beekeepers in many lands have been pleased with this most important tool in Beekeeping. Your Bingham Smoker is offered for sale by numerous dealers.

Insist on the Best

A. G. WOODMAN CO.

Grand Rapids, Mich.

MIDDLE TENNESSEE QUEENS

SIXTEEN YEARS EXPERIENCE WITH BEES

Eleven years a queen breeder
Three-banded Italians

	1	12	100
Untested	\$1.00	\$11.00	\$ 80.00
Select Untested	1.25	14.00	105.00
Tested	1.75	18.50	145.00
Select Tested	2.00	22.00	170.00
Day old queens 50c each			

We guarantee satisfaction and safe arrival in U. S. and Canada

MIDDLE TENNESSEE APIARIES

LEO C. PARKS, Manager

SPRING HILL, TENNESSEE

BEES AND QUEENS

Packages with untested Queens

2 lb. \$4.25 each, 10 @ \$4.00, 25 @ \$3.75
3 lb. \$5.25 each, 10 @ \$5.00, 25 @ \$4.75
Queens untested \$1 each, 12 @ 85c, 25 @ 80c, 100 @ 75c.
Tested Queen 50c each extra.

SATISFACTION GUARANTEED

Reference First National Bank

W. A. WHITMIRE, - Milton, Florida

OUR 1928 CATALOG

now ready and being mailed to addresses we have. Send us your name for an up-to-date catalog full of information of the latest improved hive fixtures, etc., A. I. Root Co.'s manufacture. A well-assorted stock carried on hand for prompt shipments and quick service.

J. NEBEL & SON SUPPLY CO.
Montgomery County. High Hill, Mo.

EXPORT

**We Deliver by Truck Direct to the
New Orleans Dock**

Quickest Service, Lowest Freight Rates

**Lowest Prices on Quality Goods
Manufactured of Materials Suitable
to the Tropics Direct from Factory**

GULF COAST BEE CO.,
HOUMA, LA., U. S. A.

Gaspard High Quality Queens

Golden and three-banded queens and bees are now ready for Spring 1928. The very best strain of Italians that can be produced.

One 2-lb. package with young selected queen, \$4.00 each; ten or more 2-lb. pkgs. with selected young queen, \$3.50 each; one 3-lb. pkg. with select young queen, \$5.00 each; ten or more 3-lb. pkgs. with selected young queen, \$4.50 each; one 4-lb. pkg. with selected young queen, \$6.00 each; ten or more 4-lb. pkgs. with selected young queen, \$5.50 each. One 2-frame nucleus with selected young queen, \$4.00 each; ten or more 2-frame nuclei with selected young queen, \$3.50 each; one 3-frame nucleus with selected young queen, \$5.00 each; ten or more 3-frame nuclei with selected young queen, \$4.50 each.

All bees are shipped on nice frames of brood and honey built largely on Dadant wired foundation. Hoffman frame.

Also ship combless packages at 25 cents less, each, than above prices. Satisfaction guaranteed. Health certificate attached. Twenty per cent books your order. Shipping time, April 1 to 5.

J. L. GASPARD, Hessmer, La.
Member Louisiana State Beekeeper's Ass'n

"GRAY CAUCASIANS"

We are booking orders for Bees and Queens for spring delivery from stock imported by us direct from the Tiflis service station in Russia.

Write for Booklet and Prices

BOLLING BEE CO., Bolling, Ala.

ITALIAN BEES AND QUEENS

Let us book your order for 1928

2-pound package, \$3.50
3-pound package, 4.25

F. O. B. Baton Rouge

LOUISIANA SOUTHERN BEE FARM
Route 2

Baton Rouge, La.

George L. Lott

J. W. Newton



Le Marechal Foch
Gladiolus

**Grow Gladiolus
In Your Garden**

Eighteen Le Marechal Foch Gladiolus for each new subscription to the American Bee Journal.

Lovers of flowers will welcome this opportunity to secure gladiolus bulbs in return for subscriptions to the Journal.

For every three new subscriptions at the regular rate of \$1 a year you will get 60 bulbs, and for five new subscriptions 120 bulbs. Almost a whole garden full.

The bulbs will be sent to you by Madison Cooper, editor of The Flower Grower, Calcium, New York, postpaid and with cultural directions. An assortment of sizes of bulbs is purposely given to insure a long period of bloom. Bulbs will be sent during planting time in the spring.

Send all new subscriptions to

American Bee Journal
Hamilton, Illinois

Package Bees, Queens

NEW CUSTOMERS sending full remittance with order we will make the first ten two-pound packages with young laying queens at \$2.25 per package.

If you want more than ten packages, will book your order with 10 per cent down, balance just before shipping, at \$3.50 each. Add \$1.00 extra for three-pound packages with queens. Extra queens, 85 cents each. Breeders, \$10.00 each. Years of experience in raising and shipping the finest of honey gathering Italian bees.

Blue Bonnet Apiaries, Mercedes, Texas

GUS DITTMER COMPANY SPECIALTIES

**WORKING YOUR WAX INTO FOUNDATION FOR YOU FOR CASH
AND DITTMER'S NON-SAG BROOD FOUNDATION**

We are now able to furnish a Non-Sag Brood Foundation that will give absolute satisfaction. Our MR. E. H. HANSELMAN has for several years been testing and experimenting along this line, and the result has exceeded our most sanguine expectations. Bees take to it like ducks to water, in preference to other makes, in all cases where it was used side by side with other makes of foundation. NOW IS THE TIME to send us your wax to work for you for next season. Write us for samples and prices, and we will tell you more about it.

We can also furnish you THE BEST HIVES AND SECTIONS MADE IN WISCONSIN, at best prices, in any quantity. We furnish a full line of supplies. Write us for price list.

GUS DITTMER COMPANY, Augusta, Wis.

Mention the American Bee Journal When Writing Advertisers

PACKAGE BEES

Let us book your orders EARLY. We offer a grand strain of honey producers. RESULTS COUNT—many report getting over 400 pounds of surplus honey from a three-pound package of bees and a Shaw line-bred queen, season of 1927.

Three pounds of bees and a Shaw line-bred Italian queen for \$4.50. Ten per cent discount in lots of 25 or more.

Shipped on sugar syrup. Safe arrival and satisfaction guaranteed. A health certificate with each package.

SHAW & RAMSEY, Loreauville, La.

Mr. Honeyproducer

Right prices, good stock, efficient handling of your order and bees shipped on time are what we offer our customers.

Let us tell you more.

R. V. STEARNS
Brady, Texas

OLD RELIABLE

**Mondeng for Hives, Supers,
Sections, Frames**

and all other bee supplies at factory prices. Send in your list now for special quoting if you want to save money.

**Charles Mondeng
Company**

159 Cedar Lake Road

Minneapolis, Minnesota

PURE ITALIAN QUEENS AND BEES

FOR APRIL FIRST DELIVERY

1-10 90c each; 11-100 75c each; Select Untested 10c each additional; Tested 50c additional per queen.

2 lb. Package \$3.50; 3 lb. Package \$4.50

There Has Never Been Any Disease

CALVERT APIARIES, Calvert, Alabama

HIGH GRADE GOLDEN AND THREE BANDED ITALIAN BEES FOR SALE. SEASON OF 1928

Not having lost my bees from the flood of 1927, I am in position to offer bees for April and May delivery at the following prices:

2-lb. packages with young untested queen	\$3.50
3-lb. packages with young untested queen	4.50
4-lb. packages with young untested queen	5.50

A special package as a nucleus, consisting of two frames of emerging brood and three pounds of bees with young Italian queen, for \$6.50. I furnish a health certificate with each shipment. I absolutely guarantee safe arrival all over the United States only. All losses will be replaced upon receipt of a bad order report signed by the express agent. Orders are booked with 10 per cent down. Balance ten days before shipment.

Address, H. H. BORDELON, Box 295, Marksville, Louisiana

Beekeepers Take Notice

For thirty years we have specialized in the manufacture of **Sections** from the whitest selected Wisconsin basswood

We also manufacture hives, supers, frames and shipping cases

Write for our free illustrated catalog

Marshfield Manufacturing Company
Marshfield, Wisconsin

Evangeline Apiaries--Bees and Queens for 1928

We are now booking orders for bees and queens for delivery any time after April 1. No down payment is required, but we must have remittance in full before shipment is made.

**LIGHT THREE-BANDED ITALIANS
SAFE ARRIVAL AND SATISFACTION GUARANTEED**

Two-pound packages with queens: 1 to 24, \$3.50; 25 to 49, \$3.25; 50 to 100, \$3.00. Three-pound pkgs. with queens: 1 to 24, \$4.00; 25 to 49, \$3.75; 50 to 100, \$3.50.

Purely mated queens: 1 to 24, \$1.00; 25 to 49, 90c; 50 to 100, 80c

We also have three-frame nuclei with extra pound of bees at same price as the three-pound packages. We have never had any bee disease within 100 miles of our apiary. Health certificate with each shipment.

**EVANGELINE APIARIES, 400 WEST MAIN STREET
NEW IBERIA, LA.**

BARGAINS

IN BEE SUPPLIES

Our new 1928 catalog is full of bargains for the beekeeper.

Standard dovetailed CYPRESS (the wood eternal) beehives listed cheaper than anybody offers pine.

Prompt shipment and satisfaction guaranteed
Write today for your copy

GULF COAST BEE CO., Houma, La.

VICTOR QUALITY ITALIAN BEES AND QUEENS

Established 1883—45 years on the job
and I know my stuff

W. Z. Hutchison judged my bees the best Italians at the Pan-American Exhibition. T. W. Burleson judged bees I furnished a customer for his exhibit at the State Fair of Texas, Dallas, FIRST.

I could furnish a book of testimonials showing average yields of total number of packages shipped as high as 285 pounds.

All queens reared under my personal supervision from Victor Quality Breeders, some of which have been tested in North Dakota and returned with the request, "Raise me some queens from her."

The Queen Is the Hub of the Colony

Prices—Two-pound package with untested queen: 1-10, \$3.75; 11-25, \$3.60; 26-50, \$3.50; 51 or more, \$3.25. Untested queens: 1-10, \$1.00; 11-25, 90c; 26-50, 85c; 51 and over, 80c. Tested queens, \$1.75. Breeding queens, \$10.00.

Certificate with each shipment. No deposit required. Cash must be sent before shipping date.

My Motto—You must be satisfied

W. O. VICTOR

Queen Specialist

Uvalde, Texas

GET OUR PRICES

Before Buying Beekeepers' Supplies

For your convenience we have included a coupon with this ad. Use it or write us a letter.

Our Guarantee

All goods purchased may be returned if unsatisfactory and money cheerfully refunded. No questions asked.

Our Service

While we ship all over the country, we can give special service to those located in the East—New York, Pennsylvania, New England, and Atlantic Seaboard states.

W. T. FALCONER MFG. COMPANY

FALCONER, N. Y.

W. T. Falconer Mfg. Co., Falconer, N. Y.

Gentlemen:

Without obligation on my part, please quote prices. I have _____ swarms.

_____ Hives _____ Sections

_____ Supers _____ Br. Fdn.

_____ Frames _____ Super Fdn.

_____ Bodies _____

Name _____

Town _____ State _____

Address _____

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IOWA

KANSAS

MINNESOTA

COLORADO

SOUTH
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WYOMING

Beekeepers

be sure and

get our 1928

catalog.

Early order

discounts on

your bee

supply orders.

Leahy's Standard Bee Supplies

Dadant's Wired Foundation

Honey Containers

W. R. PERRY CO.

1209 Howard Street

OMAHA, NEBRASKA

Hummer Package Bees

THE BEST

We ship only young bees and queens. We ship promptly, on sugar syrup only. We guarantee safe arrival and satisfaction. No disease here. Send for our circular.

Note the Low Prices

Two-pound package with select untested queen:

**1 to 9, \$3.50; 10 to 24, \$3.25
25 or more, \$3.00**

Three-pound package with select untested queen:

**1 to 9, \$4.50; 10 to 24, \$4.25
25 or more, \$4.00**

We have hundreds of satisfied customers
Orders booked without deposit

GEO. A. HUMMER & SON

Prairie Point, Miss.

PACKAGE BEES

Dependable Italian Queens

We supply the States and Provinces below at a big saving in Express charges



Prices

Two-pound packages, including select young LAYING Italian queens: 100, \$2.60 each; 50, \$2.65 each; 25, \$2.70 each; 10, \$2.75 each; 1 to 9, \$3.00 each

Three-pound packages with queens: 100, \$3.50 each; 50, \$3.60 each; 25, \$3.65 each; 10, \$3.70 each; 1 to 9, \$4.00 each

Queens: 1 to 10, \$1.00 each; 10 or more, 90 cents each

Deliveries start about March 20. Orders booked with 10 per cent deposit, which reserves any shipping date you specify. Queens for packages are shipped right in with the bees, the queen being in queen cage, so each can be examined upon arrival.

OUR COMPLETE GUARANTEE, backed by fifteen years' experience, specializing in the producing and shipping of Package Bees and Highest Grade Italian Queens. Financial responsibility. Saving in express charges. Young bees. Young laying queens. Prompt shipment. No disease. Overweight of bees when caged. In case of loss, prompt adjustment. Health certificate and all necessary invoice papers for all shipments. Every pound of bees or queen ordered from us must give you the service you have a right to expect.

Let us quote you on any size order, Express prepaid to your nearest Express Office. Circular free.

J. E. WING, Cottonwood, California

1928 Yancey Hustlers 1928

In Packages

A strain of Three-band Italians with a record for honey production in every section of the U. S. and Canada.

Many customers report averages of 150 to 300 pounds surplus per package. Extra liberal weight of young worker bees and vigorous young queens, delivered to you when you want them.

Now booking orders for spring delivery

OUR POLICY: "YOU MUST BE SATISFIED"

Caney Valley Apiaries

Bay City, Texas

[*Money Saved*]
[*Time Saved*]

Bee Supplies

Root's Goods at factory prices with WEBER'S service. Send us a list of your wants and we will quote you prices that will save you money.

C. H. W. Weber & Company

2163-65-67 Central Avenue

CINCINNATI, OHIO

Combless Packages Italian Bees

The very best that money can buy

No disease, no drones, extra weight, shipped when you want them and fed while in transit on the best sugar syrup

Motto: Your money's worth or money back

T. W. BURLESON

Waxahachie, Texas

St. Romain's High Quality Bees

Away back from 1902 I commenced rearing ITALIAN QUEENS with the object of improvement constantly in view.

By careful selection during all this time I have succeeded in producing a strain of light three-banded Italian, known as ST. ROMAIN'S HIGH QUALITY BEES, which has won a world-wide reputation for honey gathering and gentleness.

Now I am booking orders for the coming season of 1928, as follows:

1-2-lb. pkg. with queen on comb honey in for \$3.50 each.	From 50 up, \$3.00
1-2-lb. pkg. with queen shipped combless	\$3.00 each
1-3-lb. pkg. with queen shipped on comb honey in for \$4.50.	From 50 up, \$4.00
1-3-lb. pkg. with queen shipped combless	\$4.00 each
1-4-lb. pkg. with queen shipped combless	\$5.00 each
1-4-lb. pkg. with queen shipped on comb of honey in for \$5.50.	From 50 up, \$5.00

Orders booked with 20 per cent down; balance 10 days before shipment.

All bees will be shipped in light and roomy cages, less express charges.

I guarantee safe arrival, a health certificate with each shipment, and I will add enough bees in each package for shrinkage in transit.

Address **JOHN ST. ROMAIN**, Marksville, La.

Reacraft

ITALIAN BEES THAT PLEASE EVERY QUEEN SELECTED

Select untested, \$1.00; dozen, \$11.00. Select tested, \$2.00. Breeder, \$6.00. A simple method of queen-rearing given with each breeder. A safe method of introduction with each order. Thirty years of experience back of the best stock that can be found.

GEORGE H. REA, Reynoldsville, Pa.

BEEWARE EXTRACTORS

American Cans and Pails, Glass Honey Jars, Wired Foundation Catalog for the asking

If you wish prompt service, write

B. F. SMITH, Jr., Fromberg, Montana

They Sell for the Same

The price of THRIFTY three-banded Italian bees is the same as the ordinary kind, but the quality of **Thriftness** that has made them leaders since 1892 makes them the most attractive buy of the season.

When You Buy Thrifty Bees You Get

Good Stock
Baby Bees
Young Queens
Full Weight Packages
Prompt Shipments
Satisfaction Guaranteed
Good Service

Ask for booklet, "Reasons Why." If you buy bees or queens, this booklet will be of value to you.

W. J. FOREHAND & SONS

Fort Deposit, Ala.

Since 1892

Golden Queens and Banded Bees

Untested queens	\$1.00 each
Tested queens	\$1.50 each
Bees	\$1.50 per lb.
Nucleus	\$1.50 per frame

Bees inspected; free from disease

J. W. SHERMAN, VALDOSTA, GA.

PACKAGE BEES

Shipped by express on sugar syrup without comb.

(Shipped on comb by request only.)

No disease and safe arrival guaranteed. Health certificate attached. Twenty per cent with order.

With select untested Italian queen:

1 to 10 2-lb. pkgs. \$3.75 each
10 to 25 2-lb. pkgs. 3.65 each
25 or more 2-lb. pkgs. 3.50 each

For 3-lb. pkgs. add \$1.00 to each package above. Without queen, deduct \$1.00 each.

JOHN A. WILLIAMS

Box 178, Oakdale, Louisiana

Service From

CHICAGO

We maintain a downtown

LOCATION

Convenient for your personal call.

Your communications may reach us promptly.

Quick deliveries may be made to any of our 27 railroads.

Write for Our 1928 Catalogue

**The A. I. Root Co.
of Chicago**

224 W. Huron Street

CHICAGO, ILL.

PURE ITALIAN QUEENS

Of tested quality. April to November delivery. Bees inspected. Select untested, \$1.00; dozen, \$9.00. Discount on advance orders.

HUNTER & REAMY, Quitman, Ga.

LISTEN:

Prepare for a honey crop by using Palmette three band Italian Queens and Bees.

One Queen 75c, Dozen \$8.00

Package Bees—2 lbs. \$3.75; six for \$21.00; 3 lb. \$4.75; six for \$27.00. (Good Queen to each package). Good weight and healthy bees guaranteed.

C. G. ELLISON, Belton, S. C.

Package Bees for 1928**3-Band Italian Bees and Queens**

Our bees are real Producers

We ship promptly. No delays

Absolutely no disease in our locality

DELIVERY GUARANTEED

Be sure to send for our free circular and other valuable information

The Phoenix Apiaries

G. F. BLAIR, Mgr.

910 W. Fillmore St., Phoenix, Arizona

(Formerly The LOVEITT HONEY CO.)

HIGH GRADE ITALIAN QUEENS

HEALTH - CERTIFIED

Three - Banded Only

Every one of them carefully selected. Safe arrival and satisfaction guaranteed. One, \$1.00; Twelve, \$10.00. Certificate of inspection with every shipment.

URIAH APIARIES, Box A, Uriah, Alabama, U. S. A.

PURE ITALIAN QUEENS AND BEES

My business is to produce and sell the best possible stock Prompt shipment, safe arrival, and full satisfaction guaranteed

PRICES

Two-pound Packages with young LAYING queens:

1 to 9, each, \$3.40; 10 to 24, each, \$3.00; 25 to 100, each, \$2.75

Three-pound Packages with young LAYING queens:

1 to 9, each, \$4.40; 10 to 24, each, \$4.00; 25 to 100, each, \$3.75

Special Prices on Large Shipments

Terms—10 per cent with order; balance before shipment.

Reference—Bank of Northern California, Redding, California.

J. W. Di LULLO, Anderson, Calif.

ATTENTION BEEKEEPERS

I am now booking orders for package bees for 1928 delivery, and quote following prices:

Two-pound packages with select young queens,

1 to 24, \$3.50; 25 to 49, \$3.35; 50 to 100, \$3.10 each

Three-pound packages with select young queens,

1 to 24, \$4.50; 25 to 49, \$4.35; 50 to 100, \$4.10 each

Two- and three-frame nuclei at same prices as packages. Tested queens, 50c extra

I have the best stock of three-band Italian bees I have been able to purchase or breed. There has never been any foulbrood in this portion of the State, and certificate of inspection will be furnished with each shipment. I use liquid feed and guarantee safe delivery. Will replace or refund on receipt of bad order report signed by the express agent at point of delivery. Will begin making shipments early in April.

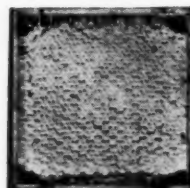
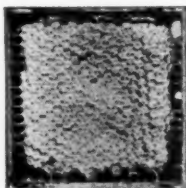
I have been local representative for R. G. Dun & Co. for nearly 20 years, and refer to any bank or banker in this section of the State.

N. L. STAPLETON, Colquitt, Georgia

Mention the American Bee Journal When Writing Advertisers

Comb Honey Sells First on Appearance Its Quality and Flavor Bring Repeat Orders

Top and bottom starters of Surplus Foundation result in well-filled sections. The starters guide the bees in drawing out the comb. Without starters comb is built in every direction, resulting in unmarketable sections.



These sections were built on top and bottom starters. Comb is built all around the section frame, making fancy grading possible. The even, well-filled sections sell easily, due to their attractive appearance.

Dadant's Surplus Foundation

Is Pure Beeswax and Made to Become a Part of the Comb

The big point in a good section of comb honey is its appearance. Appearance will sell comb honey as fast as it's made, but the honey must look good enough to eat.

And the heart of it is foundation! The fullness of the section, the evenness of the comb—a large part of the appearance is due to the foundation. The biting quality, the delicate "center" taste that sends the customer back for more, is also in the foundation.

Dadant's Surplus Foundation is more than a sheet of beeswax. It is so made that it becomes a part of the honey, a delightfully edible part. We select the very choicest beeswax we can get for it and it is milled by experts who have been studying its making for over fifty years.

Each sheet is dainty and clear, with a delightful fragrance. It is truly a fitting base upon which to build that most splendid product of the hive—section comb honey.

DADANT & SONS

FOUNDATION
MANUFACTURERS

WIRED—PLAIN—SURPLUS
Write for Name of Nearest Dealer

HAMILTON,
ILLINOIS

BEES SAFE DELIVERY QUEENS

Our bees are supplied young, prepared for shipment so they will arrive safe. Our delivery last season was 100 per cent. Why take chances? You lose time even if lossage is made good. THE QUEENS must be of good stock well developed that you receive with your bees if you wish success. Satisfaction guaranteed or money back.

Prices

Two-pound packages with queens:

1	10	25	50
\$4.00	\$3.75	\$3.60	\$3.50

Three-pound packages with queens:

1	10	25	50
\$5.00	\$4.75	\$4.60	\$4.50

Untested queens:

1	10	25	50
\$1.00	\$9.00	\$20.00	\$37.50

The Citronelle Apiaries
Citronelle, Alabama

"A real Treasure Chest of 'English unde-
filed.' We recommend it unreservedly"

—Review of Reviews



MARCH'S THESAURUS DICTIONARY

gives you complete mastery over the English Language. Finds instantly the right word to express your every thought, the exact word for your desired shade of meaning, and defines these words so that you know you are using them correctly. A thesaurus, plus a dictionary, with encyclopedic information on literature, history, geography, etc. 1462 pages, 7¼x10 inches, on thin opaque paper. Bound in handsome Buckram.

INSPECT AT OUR RISK

this Treasure House of Words and Knowledge. Send in the coupon below. Use the book for ten days. Then if you do not find it most useful and valuable, you simply need return it.

Send on Approval Coupon

HISTORICAL PUBLISHING CO., Dept. BJ 2-P
1334 Cherry St., Philadelphia, Pa.

Please send me (postpaid in United States and Canada) the new Amplified Edition of March's Thesaurus Dictionary. I will pay the postman \$3.00 plus 12c C. O. D. fee, and if I keep the book, will pay you \$2.00 per month for three months. (Canada duty extra. Foreign, \$10, cash with order.)

If for any reason I do not wish to keep it, I will return it in good condition within 10 days and you are to refund my \$3.12.

Name _____

Address _____

Golden Queens

Beautiful, gentle, and good honey gatherers. Ready for shipping April 1.

Select (one grade only) young laying queens, \$1.00 each; ten or more, 90c each. Tested, last fall rearing, \$1.75 each. We have a special made, queen laying on comb, self introducing cage in which we guarantee safe introduction of queen. The price is 50c additional.

No disease. Health certificate. Safe arrival and satisfaction guaranteed.

The Golden Apiaries

Letohatchie, Alabama

JASPER KNIGHT, Owner H. N. MAJOR, Manager

JENSEN'S BEES & QUEENS

Are giving utmost satisfaction to hundreds of beekeepers throughout North America. Many years of study and practice as queen breeders and package shippers on a large scale have contributed to our present reputation, which was built on a "Quality First" basis.

We love the bees, have faith in the bee business, expect to continue in it a long time yet, and will always play the game in a way creditable to our name, and gratifying to our customers.

Everything we ship produced right here, gets our personal inspection. It must be right or it doesn't go. If you haven't our folder, it is because we haven't your name. A postal brings it. Full of inside information.

Prices for April and May Delivery

Two-pound packages Italian bees with select young queens—1 to 24, \$3.50; 25 to 49, \$3.35; 50 to 100, \$3.10 each.

Three-pound packages Italian bees with select young queens—1 to 24, \$4.50; 25 to 49, \$4.35; 50 to 100, \$4.10 each.

Queens, both in packages and separately, are untested, of the season's rearing, fresh from our own queen yards; we stand behind them. 1 to 9, \$1.00; 10 to 24, 95c; 25 to 49, 90c; 50 to 100, 85c each.

Health certificate with every shipment.
Safe arrival guaranteed

JENSEN'S APIARIES, Crawford, Miss.

Before Buying Your Bee Supplies

Write for our 1928 catalog and send us a list of your requirements for special quotations.

We specialize in the manufacture of sections, hives, supers, frames, and shipping cans, and are in a position to save you money on your supplies.

We have a complete stock of everything for the beekeeper and can make prompt shipments.

SATISFACTION GUARANTEED
or money refunded

A. H. Rusch & Son Co.
Reedsville, Wisconsin

BEES

In Any Kind of Package at Any Time You Want Them.

Nice, bright Italians of good honey-gathering strain (John M. Davis)

Queens introduced in nuclei caged inside of combless

**Your money's worth
or money back**

Lewis Beeware and Dadant's Foundation

J. G. PUETT & SONS
MOULTRIE, GA.

Dadant's Plain Foundation For the Man Who Wires His Own Frames

Dadant's Plain foundation is made only of the **purest beeswax**; refined without chemicals and retaining the sweet smell of the hive and honey that bees accept.

Comb foundation is made of sheets of wax pressed between metal mills, in exact re-

production of the base of bees' comb. The sheets are just right to fit the frames used in the hives.

There is absolutely no **substitute nor shoddy** in it. Each sheet is inspected and carefully wrapped to reach you in perfect condition, ready for use.

FOUNDATION
MANUFACTURERS

DADANT AND SONS
WIRED — PLAIN — SURPLUS

HAMILTON,
ILLINOIS

BRAZOS VALLEY APIARIES CAMERON, TEXAS

BEES AND QUEENS

BRAZOS VALLEY APIARIES CAMERON, TEXAS

I am going to offer about 500 packages of Italian bees with young laying queens at the following bargain prices for March, April and May delivery:

1	2-lb. package with Italian queen	\$ 3.50	1	3-lb. package with Italian queen	\$ 4.25
10	2-lb. packages with Italian queens	32.50	10	3-lb. packages with Italian queens	41.25
25	2-lb. packages with Italian queens	78.00	25	3-lb. packages with Italian queens	100.00
50	2-lb. packages with Italian queens	150.00	50	3-lb. packages with Italian queens	195.00
100	2-lb. packages with Italian queens	290.00	100	3-lb. packages with Italian queens	380.00

Remember, a young three-band or leather colored Italian queen is included with each package without extra cost. I guarantee safe delivery, and will replace, without quibbling, any shipment that may be lost or damaged in transit. These are the very best strain of Italians that money can buy and that I can produce, and there is none better. I have been shipping bees in large quantities all over the U. S. and Canada for many years and have reached almost the 100 per cent mark of success in safe delivery. Orders will be filled promptly on the day wanted, with absolute full weight, and drones screened out. We have never had a case of foulbrood in this county, and a certificate of health will accompany each shipment. Ten per cent books your order, or you may order direct from this ad. If I should be sold out and unable to make shipment, your money will be returned in the first mail after being received.

References: Citizens National Bank, of this place

H. E. GRAHAM, Cameron, Texas, P. O. Box 735

Glass and Tin Honey Containers

2½-lb. cans in cartons of 100	\$4.00 car.
5-lb. pails in cartons of 50	3.50 "
10-lb. pails in cartons of 50	5.00 "
60-lb. tins, NEW, 2 tins per case	1.00 case
60-lb. tins, USED, 2 tins per case	.35 "
160-lb. kegs (the ideal container for both Buckwheat and Clover Honey)	1.20 each

GLASS JARS WITH GOLD LACQUERED CAPS

16-oz. Honey Capacity, 2 doz. per carton	\$1.20 car.
3-lb. or Quart Capacity, 1 doz. per carton	.90 "

SPECIAL HAZEL-ATLAS TALL JARS

8-oz. Honey Capacity, 2 doz. per carton	\$1.05 car.
16-oz. Honey Capacity, 2 doz. per carton	1.35 "
2-lb. Honey Capacity, 1 doz. per carton	.95 "

BEE SUPPLIES

AT SPECIAL PRICES. SEND FOR OUR PRICE LIST

HONEY

ALL GRADES—ANY QUANTITY

HOFFMAN & HAUCK, Inc.

Ozone Park, New York



"Honeymoon Lane"

Brilliant in red, green and gold—Canco pails help your new and repeat business. Three sizes—2½ lb. cans, 5 and 10 lb. pails.

Canco honey pails are distributed by

Colorado Honey Producers Association, Denver, Colo.
Dadant & Sons, Hamilton, Ill.
Fargo Seed House, Fargo, N. D.
G. B. Lewis Company, Watertown, Wis.
10 Tivoli Street, Albany, N. Y.
1304 Main Street, Lynchburg, Va.
1921 E. 4th Street, Sioux City, Iowa
318 E. Broad Street, Texarkana, Ark.
W. R. Perry Company
Omaha, Nebraska
B. F. Smith, Jr., Fromberg, Mont.
Standard Lumber Co., Winona, Minn.

Canadian Canco honey containers are now available f.o.b. Brandon and Winnipeg. Apply to Hamilton for quotations.

MANY apiarists are so happily wedded to the quality of their honey that they fail to see the imperfections in its dress.

If your honey is good, it is worth packaging attractively, and Canco containers can help you do this.

Canco honey pails help first sales and repeat sales; the first because their bright lithography catches the eye, the second because your name is prominently displayed.

Get in touch with a Canco salesman if you want your honey sales to grow.

American Can Company

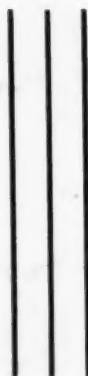
CONTAINERS OF TIN PLATE • BLACK IRON GALVANIZED IRON FIBRE
METAL SIGNS AND DISPLAY FIXTURES

New York
Chicago
San Francisco
Hamilton, Ont.



Sales Offices
in all
principal cities

48 Years of Profit 50 Years of Satisfaction



Metal covered top made of
full thickness lumber

* * *

Sides and ends are made of
full thickness lumber. Cy-
press packed bottom built in.

* * *

Bees completely surrounded
with packing material, the
wall being 2 5-8 inches thick.



Buckeye hive showing food-chamber
inside of packed rim

Buckeye hives, properly painted, will last fifty years. Yes, there is practically no wear out to them.

Buckeye hives save approximately ten pounds of honey stores each year, which, alone, will more than pay the added first cost in four years—46 years left for profit.

Buckeye hives save a big expense in labor and material for packing bees for winter quarters—enough to pay for Buckeye hive protection every four years—46 years left for profit.

Counting the saving of stores and the saving of labor, the extra cost of the Buckeye hive over a single-walled hive is saved in two years.

Buckeye hives not only bring more bees through the winter alive, but result in stronger colonies for the honeyflow, and for the commercial bee-keeper, more uniform colonies.

Only \$3.00 Extra

In knocked down form.

PLAN FOR SOME
BUCKEYE HIVES
THIS YEAR

The A. I. Root Company

MEDINA, OHIO

Root
QUALITY
BEE SUPPLIES